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Award Contracts For Government Paper

Successful Bidders For Supplying the Government Printing Office With Paper For the Six Months' Period Beginning July 1, 1941, Are Announced By the Joint Congressional Printing Committee.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 28, 1941—Awards were made on Monday for paper for the use of the Government Printing Office for a six months period beginning July 1 next by the Joint Congressional Committee on Printing. The bids were received on May 19. Awards announced by the committee on Monday were as follows:

No. 1, National Pulp & Paper Company, 340,000 pounds at 2.85 cents. Paper Corporation of U. S., balance at 3.33 cents.

No. 3, Mudge Paper Company, 6.059 cents.

No. 4, Mudge Paper Company, 6.059 cents.

No. 5, Mudge Paper Company, 6.059 cents.

No. 6, Mudge Paper Company, 5.409 cents.

No. 7, Perkins-Goodwin Company, 5.37 cents.

No. 8, Frank Parsons Paper Company, 5.395 cents.

No. 9, Perkins-Goodwin Company, 5.47 cents.

No. 11, Mudge Paper Company, 5.92 cents.

No. 12, Mudge Paper Company, 5.57 cents.

No. 13, R. P. Andrews Paper Company, 6.36 cents.

No. 14, Stanford Paper Company, 14.50 cents (70 lb.); Old Dominion Paper Company, 12.491 cents (100 lb.)

No. 15, Marquette Paper Company, 6.79 cents.

No. 16, Mudge Paper Company, 6.38 cents.

No. 17, R. P. Andrews Paper Company, 5.639 cents.

No. 18, No bids.

No. 19, Old Dominion Paper Company, 13.89 cents.

No. 20, Old Dominion Paper Company, 9.75 cents.

No. 21, Old Dominion Paper Company, 9.75 cents.

No. 22, Old Dominion Paper Company, 9.75 cents.

No. 23, Paper Corp. of U. S., 12.36 cents.

No. 24, Paper Corp. of U. S., 17.67 cents.

No. 25, Cauthorne Paper Company, 17.49 cents.

No. 26, Frank Parsons Paper Company, 6.069 cents.

No. 27, Marquette Paper Company, 5.921 cents.

No. 28, Frank Parsons Paper Company, 5.897 cents.

No. 29, Marquette Paper Company, 5.491 cents.

No. 30, R. P. Andrews Paper Company, 5.40 cents.

No. 31, R. P. Andrews Paper Company, 5.40 cents.

No. 36, Perkins-Goodwin Paper Company, 7.57 cents (1,000,000 pounds); and Paper Corp. of U. S., 7.50 cents (500,000 pounds).

No. 37, Mudge Paper Company, 13.28 cents.

No. 40, Paper Corp. of U. S., 10.28 cents.

No. 43, Whitaker Paper Company, 5.52 cents.

No. 44, Cauthorne Paper Company, 6.81 cents.

No. 47, Aetna Paper Company, 7.895 cents (2,000,000 pounds); Old Dominion Paper Company, 7.69 cents (500,000 pounds) and 7.94 cents (1,500,000 pounds).

No. 51, R. P. Andrews Paper Company, 11.26 cents.

No. 52, R. P. Andrews Paper Company, 11.10 cents (white); 11.75 cents (blue).

No. 53, Whitaker Paper Company, 12.80 cents.

No. 54, Eastern Corp., 6.79 cents.

No. 55, Whitaker Paper Company, 5.90 cents.

No. 56, Perkins-Goodwin Company, 6.40 cents (2,500,000 pounds) and Barton, Duer & Koch Paper Company, 6.27 cents (2,500,000 pounds).

No. 57, Eastern Corp., 6.56 cents.

No. 58, R. P. Andrews Paper Company, 5.37 cents.

No. 59, Barton, Duer & Koch Paper Company, 5.86 cents.

No. 60, Cauthorne Paper Company, 7.97 cents.

No. 61, Old Dominion Paper Company, 7.0743 cents.

No. 62, Whitaker Paper Company, 6.55 cents.

No. 63, R. P. Andrews Paper Company, 23.33 cents.

No. 64, Old Dominion Paper Company, 9.742 cents.

No. 65, Stanford Paper Company, 10.86 cents.

No. 66, Mudge Paper Company, 12.67 cents.

No. 67, Mudge Paper Company, 12.48 cents.

No. 69, Paper Corporation of U. S., 18.56 cents (200,000 pounds); R. P. Andrews Paper Company, 18.18 cents, (150,000 pounds) and Barton, Duer & Koch Paper Company, 18.90 cents (50,000 pounds).

No. 70, Graham Paper Company, 8.50 cents.

No. 71, Paper Corporation of U. S., 9.10 cents.

No. 73, Marquette Paper Company, 16.60 cents.

No. 74, Stanford Paper Company, 13.03 cents (150,000 pounds); same firm 13.33 cents, same

(Continued on page 36)

Abitibi Report Creates Much Speculation

Calculations Based On Company's Report For 1940 Indicates Increase In Profits of Over 36 Per Cent For First Four Months of 1941 — Pulp Shipments Up — Profits of Subsidiaries Higher.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., May 26, 1941—Pencil and paper devotees began a new flock of tricks with figures this week on the appearance of the Abitibi Power and Paper Company report for 1940 and the progress of the corporation so far this year. Some intriguing calculations are being made, based on the profit for 1940 of $3,687,505, available for bond obligations and income taxes, if any; the increase last year of $8,055,715 net working capital; profits available for depreciation and bond obligations in April, 1941, of $695,828, a gain of 32.49% and profits on the same basis for the first four months of 1941 of $2,387,165, an increase of 36.23% over a like period a year ago.

Should the position of the company remain approximately the same during the next four years, some of the pencil artists figure, as in 1940, adding $8 million dollars each year to net working capital by the end of 1944 that account would probably amounty to $51,000,000. That would be sufficient to pay both current interest and overdue and unpaid interest up to that date, and still leave $11,000,000 net working capital.

Whether or not Abitibi will have to pay taxes on its 1940 operations is another question that has been raised. That depends, to a great extent, it is said, on allowances made for obligations overdue as well as due. It is calculated that bond interest, including interest on overdue and unpaid interest, works out at close to $3,500,000 per annum, in Canadian funds, and $3,850,000 in United States funds. The latter figure would absorb more than profits in 1940, and, in that event, it is argued, there would be no income tax charge. (The unlisted bond market in Toronto in the past week was featured by a rise in Abitibi 5's, the actual bonds rising three points to 67-69, and the C.O.D.'s gaining two and a half points to 63½-65½.)

The report of earnings for April of Abitibi Power and Paper Company, shows $695,728 prior to audit and charges for depreciation and bond interest, compared with $687,529 in March and $525,116 in April, 1940. Included in April, 1941, earnings, is $144,308 received in U. S. exchange.

For the four months ended April, earnings on above basis were $2,378,165 against $1,745,639 in the corresponding four months of 1940.

Newsprint Shipments Steady

Shipments of newsprint in April according to G. T. Clarkson, receiver and manager, were 34,476 tons, compared with 38,196 tons in March and 30,798 tons in April, 1940, Present indications are shipments of newsprint will be about 34,000 tons in May, this year, compared with 48,597 tons in May, 1940.

Pulp Shipments Up in April

Shipments of sulphite pulp in April were 7,043 tons, compared with 6,537 tons in March and 5,672 tons in April, 1940. Present indications are shipments of sulphite pulp in May will be about 7,000 tons, compared with 6,611 tons in May, 1940.

Subsidiaries Show Improvement

Profits of the Manitoba Paper Company, Ltd., subsidiary of Abitibi Power and Paper Company, for the year 1940, before providing for income and excess profits taxes, if any, amounted to $98,803.

Net operating profit, before depreciation and bond interest, was $940,053, from which depreciation of $595,000 and bond interest of $346,250 were taken. Operating profit in the previous year was $580,810, from which $180,000 was provided for depreciation.

Balance sheet shows current assets of $1,126,966 and current liabilities $161,484, leaving net current assets of $965,482, compared with net current assets of $1,112,977 at the end of the previous year.

The Thunder Bay Paper Company, Ltd., another Abitibi subsidiary, shows a profit for the year of $557,890, after depreciation of $515,000. In 1939 profit was $450,706, after depreciation allowance of $150,000.

Balance sheet reveals current assets of $1,077,407 and current liabilities of $89,729, making net working capital $987,678, compared with net working capital of $1,010,280. Other liabilities than current include $261,278 owing to parent company and receiver and manager.

The Ste. Anne Paper Company, Ltd., operating profit for the year 1940 amounted to $848,997, compared with $242,301 in 1939. From 1940 profit, $475,000 was taken for depreciation and $394,750 for bond interest, leaving a net loss of $20,752.

Balance sheet shows current assets of $1,591,863 and current liabilities of $112,248, leaving net working capital of $1,479,615, compared with net working capital of $1,210,477. Owing to Abitibi Power and Paper and receiver and manager on advances for extensions is $6,449,780.

The Abitibi Electric Development Company, Ltd., another subsidiary, earned operating profits of $457,750 in 1940, compared with $158,714 in 1939. From 1940 profits $390,000 was absorbed for depreciation in contrast with $145,000 in 1939. In 1940 bond interest absorbed $257,750, leaving a net loss for the year of $190,000.

Balance sheet shows current assets of $27,025 and current liabilities of $8,387, against current assets at the previous year-end of $28,728 and current liabilities of $10,729. Owing to the parent company was $204,945.

Profit from the operation of Kaministiquia Power Company, Ltd., in 1940 totaled $272,996, compared with $273,491 in the previous year. Depreciation in 1940 absorbed $190,000 and bond interest $175,000, making a net loss of $92,003. In the previous year net loss was $19,508, after $118,000 depreciation and $175,000 interest.

Current assets appear at $24,375, against current liabilities of $10,392, compared with $11,963 and $5,739 in the previous year. Owing Abitibi and receiver was $1,363,005 at the close of 1940.

DON'T LET

DIRTY FELTS

GUM UP PRODUCTION

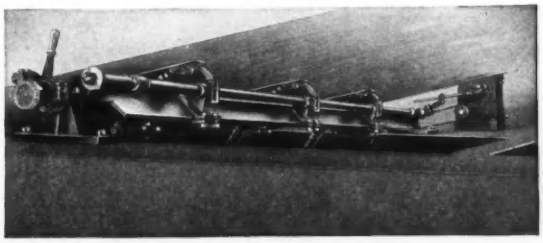
Judging by the number of Vickery Felt Conditioners going on the job lately this is no time to put up with needless paper machine shutdowns for washing up clogged, dirty felts.

Why risk putting such a crimp in machine production when you can keep the felts going full tilt right through every week by simply putting in Conditioners?

Don't keep putting it off. Write for layouts and estimates.

BIRD MACHINE COMPANY • SOUTH WALPOLE, MASS.

VICKERY



FELT CONDITIONERS

Mill Members of Paper Institute Confer

Problems and Possibilities That Face Paper and Pulp Manufacturers Discussed At Sixth Annual Executives' Conference of Mills of Institute of Paper Chemistry—Registration List of Representatives.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., May 26, 1941—Problems industry and research must face when demobilization takes place were paramount in discussions at the sixth annual executives' conference of member mills of the Institute of Paper Chemistry here Thursday and Friday of last week. Total registration was approximately 150.

Possibilities that face the paper and pulp manufacturers were outlined by Sidney D. Kirkpatrick, editor of Chemical and Metallurgical Engineering magazine, at a luncheon Thursday noon at the North Shore Golf Club. Methods which will cushion any economic shock were set forth, and it was pointed out that research for new products and more efficient production would be of material assistance.

The approach and experiences involved in mediating labor situations were dealt with in a banquet address at the golf club Thursday evening by Dr. Don D. Lescohier, professor of economics at the University of Wisconsin. He took the place of Dr. Clarence Dykstra, president of the university, who was scheduled to speak but was unable to attend because of the press of his duties in Washington as chairman of the federal mediation board and head of selective service. Dr. Lescohier urged the executives to develop close and cordial relations with workers, to try to appreciate labor's side of problems, and create a spirit which will effect harmony and cooperation.

Registration List of Mills and Officials

C. S. Boyd of the Appleton Coated Paper Company; J. N. Bergstrom and L. A. Carpenter of the Bergstrom Paper Company, C. H. Schacker of the Blandin Paper Company, Grand Rapids, Minn.; H. P. Carruth of Brown Company, Berlin, N. H.; C. B. Clark of Riverside Paper Corporation; Stanton Mead of Consolidated Water Power and Paper Company, Wisconsin Rapids; W. Irving Osborne and A. W. Miller of Cornell Wood Products, Cornell; M. Fillius and K. Huse of Eastman Kodak Company, Rochester, N. Y.; E. A. Oberweiser, D. E. Oberweiser, R. F. Bellack, W. M. Roberts and A. G. Wakeman of Fox River Paper Corporation.

Colin Gardner, III, and Roland Richardson of the Gardner-Richardson Company, Middletown, Ohio; A. C. Gilbert and George Gilbert of the Gilbert Paper Company, Menasha; P. Koenig of P. H. Glatfelter Company, Spring Grove, Pa.; Norman W. Wilson, D. S. Leslie and R. P. Price of the Hammermill Paper Company, Erie, Pa.; J. M. Conway of the Hoberg Paper Mills, Green Bay; Stuart E. Kay of International Paper Company, New York city; F. J. Sensenbrenner, Ernst Mahler, John Sensenbrenner, J. Leslie Sensenbrenner, C. G. Parker, H. G. Boon, John Kimberly, Fred S. Seaborne, William Kellett, W. H. Clifford, Fred Hunt, Fred Kranhold, C. A. Fourness, C. W. Nelson, H. A. Rothchild and C. G. Eubank of Kimberly-Clark Corporation, Neenah.

D. C. Everest, John Stevens, Jr., Leo Croy, Allen Abrams, W. H. Graebner, Roy J. Sund, Al Stompe, Don Snyder and Frank Broeren of Marathon Paper Mills Company, Rothschild; George H. Mead, R. H. Savage and John Traquair of the Mead Corporation, Chillicothe, Ohio; Norman S. Stone of Mosinee Paper Mills Company, Mosinee; D. K. Brown and Leo O. Schubart of Neenah Paper Company, Neenah; John Alexander of Nekoosa-Edwards Paper, Company, Port Edwards; Earle Murray of Northern Paper Mills, Green Bay; R. K. W. Ulm and C. E. Carpenter of the Ohio Boxboard Company, Rittman, Ohio; Folke Becker and Rhinelander Paper company, Rhinelander.

John L. Riegel of Riegel Paper Corporation, New York City; C. B. Martin and Lyman Beeman of St. Regis Paper Company, New York City; W. H. Swanson of Technical Association of the Pulp and Paper Industry; Karl E. Stansbury, E. H. Jennings and C. R. Seaborne of Thilmany Pulp and Paper Company, Kaukauna; S. B. Bugge of Tomahawk Kraft Paper Company, Tomahawk; L. G. Estep of United Wall Paper factories, New York City; David L. Luke, Jr., New York City, F. G. Rawling, Piedmont, W. Va., L. W. Strattner, Mechanicville, N. Y., H. Drew Stroup, Williamsburg, Pa., Edwin S. Hooker, Tyrone, Pa., and Paul B. Lacy, Covington, Va., of the West Virginia Pulp and Paper Company; R. M. Sensenbrenner of George A. Whiting Paper Company, Menasha.

J. H. Miller of Whiting-Plover Paper Company, Stevens Point; Hugh Chrisholm of Oxford Paper Company, Rumford, Maine; Carl Magnus of Wausau Paper Mills, Inc., Brokaw; Harold Murdock of Champion Paper and Fibre Company, Canton, N. C.; Ralph A. Hayward of Kalamazoo Vegetable Parchment Company, Parchment, Mich.; C. G. Campbell, Kewaunee Manufacturing Company, Kewaunee; E. W. Tinker and Ben Cancell of American Paper and Pulp association, New York City.

George D. Bearse, of the Maine Seaboard Paper Company, Bucksports, Maine; T. P. Bullock, of the Mead Corporation, Kingsport, Tenn.; Allen Abrams of Marathon Paper Mills Company, Rothschild; R. S. Hatch, of Weyerhaeuser Timber Company, pulp division, Longview, Wash.; J. H. Levandoski, of John Strange Paper Company, Menasha; Johannes Westergaard, of Castle & Overton, New York City; Emil R. Padavic, of Hoberg Paper Mills, Inc., Green Bay; and E. D. Rich, of Oregon Pulp and Paper Company, Salem, Ore.

Morris Dobrow of Writing Paper Manufacturers Association, New York City; R. E. Canfield of Groundwood Paper Manufacturers Association, New York City; C. W. Boyce of Kraft Paper Association, New York City; Thomas J. Burke of Sulphite Paper Manufacturers Association, New York City; T. Friedlander of Phoenix Hosiery Company, Milwaukee; L. H. Reed of Southern Kraft Corporation, Continental division, Marinette; and K. A. Swenning and H. E. Brinckerhoff of the American Pulpwood Association.

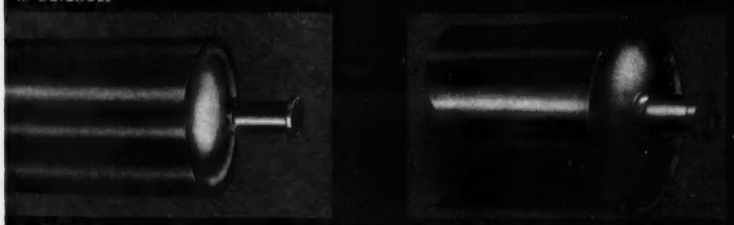
Check Chart FOR DRYERS

● It is our contention that Black-Clawson seamless dryers have certain definite advantages over the ordinary bolted head dryer. That more than 18,000 B-C seamless dryers have been sold ***with but one known operating failure,*** goes far to support our belief.

On this page is your opportunity to compare dryers. Do so and we believe the next time you need dryers you'll insist on Black-Clawson seamless. ***The Black-Clawson Company, Hamilton, Ohio. Shartle Division, Middletown, Ohio. Dilts Division, Fulton, N. Y.***

✔ B-C seamless dryers are turned in balance (above left), require no balance weights as do bored dryers (above right). 77 twenty year old B-C dryers were recently checked for true. None was off more than .041", the average much less. ***Seamless dryers stay in balance.***

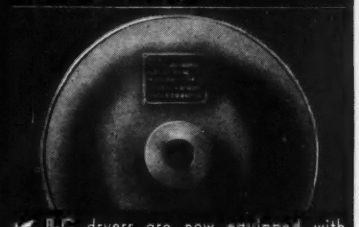
✔ After 40 years of hard service, this B-C dryer withstood 550 lbs. P. S. I. before it burst. Note that heads did not go out. ***Seamless dryers are stronger—meet ASME and all state codes.***



✔ Since journals of B-C seamless dryers are cast integral with shell (above left) they withstand higher steam pressures. Bolted head dryers (above right) are seldom completely tight. Water oozes through, making them unsuited for higher steam pressures. ***Seamless dryers cannot leak.***

✔ Heads of B-C dryers are close to end of face. There is no large projecting flange to interfere with uniform drying to edge of shell. ***Uniform Drying is a Seamless Advantage.***

✔ The inside of B-C dryers, being unbored (top left), retains rust-resisting glass-like film, speeds up heat transfer. Bored dryers (top right) quickly rust, cut down on drying efficiency. More oil and film clings to this surface. ***Seamless dryers are cleaner, give greater heat transfer.***



✔ B-C dryers are now equipped with large, easily read plate with full data as to strength and other operating details. ***Seamless dryers cut down on operating uncertainties.***

BLACK-CLAWSON SEAMLESS DRYERS

Mill Executives Attend Safety Meeting

Attendance At Fox River Valley and Lake Shore Safety Conference Approximates 2,000 With Large Representation From Paper and Pulp Mills—Northern Superintendents Meet—Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., May 26, 1941—Approximately 2,000 persons attended the Fox River Valley and Lake Shore Safety Conference when its annual gathering was held at Fond du Lac, Wis., Thursday, May 22. It drew a large representation of executives, personnel directors, foremen and safety workers from paper and pulp mills and allied industries.

L. C. Smith, personnel director of the Thilmany Pulp and Paper Company, Kaukauna, Wis., and H. F. Hackworthy of the Combined Locks Paper Company, Combined Locks, Wis., presided at the pulp and paper sectional meeting in the afternoon. Valuable discussions took place on safety problems in the mills. The principal address was made by L. J. Barrette of the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis. He described the safety program followed by the four mills of his company, and how the employees were stimulated to achieve outstanding records.

Methods for Greater Safety Discussed

Methods to be pursued for greater factory and warehouse safety were outlined by C. E. Wellnitz, Chicago, speaking on the subject of "How to Do It" at a sectional meeting for paper products and finishing industries. He described hazards most productive of accidents, and ways to eliminate them. The necessity for stringent safety control in the mushrooming operations of plants expanding for defense work, and on the mammoth construction projects around the country was emphasized by George E. Burns of the National Safety Council, Chicago, in an address on "Safety in Defense." He declared that lack of close attention to the prevention of accidents is depriving the country of valuable man power when vitally needed. Sound slide films were used to illustrate his points.

I. A. Long of Green Bay, Wis., and H. D. Purdy of the Tuttle Press Company, Appleton, Wis., served as co-chairmen of the session.

There was an attendance of approximately 1,000 at the closing banquet of the conference in the evening. Voyta Wrabetz, chairman of the Wisconsin Industrial Commission, declared in a brief talk that the attendance broke previous records, and that a tremendous amount of good would be done by the gathering.

Dr. Stockdale Speaks at Banquet

The banquet speaker was Dr. Allan A. Stockdale of New York, a representative of the National Manufacturers Association, using the subject, "What Is the American Way?" "Americans are what they are because of what they hope to be," he declared. "The American way of life has all the hopes, dreams, ambitions and ideals of what the people want to be. This is no time to be afraid or lose courage about the democracy of life. The American spirit is not a pessimistic spirit and it is no day to be afraid."

Mayor Leo J. Promen of Fond du Lac, chairman of the conference, presided at the dinner. W. A. Sanders was co-chairman, A. J. Perry, treasurer, and Carl Sonnenburg, secretary.

The 1942 conference will be held at Manitowoc, Wis.

Northern Superintendents Meet

Registrations had reached 230 when the annual spring convention of the Northern Division of the American Pulp and Paper Mill Superintendents Association opened Friday afternoon, May 23, at Marinette, Wis. Executives were present from all parts of Wisconsin, Michigan and Minnesota.

J. V. Ziemann, general superintendent of the Southern Kraft Corporation's mill at Marinette presided at the business session. He is also chairman of the division. The program was devoted to a discussion of technical problems. Included among the speakers were H. A. Schmitz and H. Zerbe of the A. O. Smith Corporation, Milwaukee, Wis., whose subject was "Modern Practice in Design and Construction of Pressure Vessels," A. H. Stanton of the Mason-Neilan Company, presented an interesting discourse on "How Savings Pay for Instrument Control."

Saturday's program was to include a question box and discussion in the morning, a stag luncheon at noon at Riverside Country Club, golf and mill trips in the afternoon and a banquet in the evening.

Wives of the members enjoyed a bridge luncheon Friday at the Riverside Country Club, a dinner and a theater party. On Saturday they visited radio station WHAM and the Marinette Knitting Mills, had a luncheon at noon and a yacht-ride in the afternoon.

Consolidated Signs New Wage Pact

Wage agreements made recently between the Consolidated Water Power and Paper Company and AFL unions are embodied in the twenty-third annual contract signed May 20 at the company's offices at Wisconsin Rapids, Wis. Increases of five cents per hour were granted hourly paid workers in the company's mills at Wisconsin Rapids, Biron, Stevens Point and Appleton, Wis. The base rate of pay is now 63 cents per hour.

Signatory unions are the International Brotherhood of Paper Makers, the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, and the Machinists' and Electrical Workers' organizations.

Sensenbrenner-Luedke Nuptials

The marriage of F. James Sensenbrenner of Chicago, Ill., and Miss Margaret Luedke, Milwaukee, Wis., will take place June 28 at Milwaukee, according to announcement made last week. Mr. Sensenbrenner is a son of John S. Sensenbrenner, vice-president of Kimberly-Clark Corporation, Neenah, Wis., and is in business in Chicago.

CHEMICALS

in the

Pulp and Paper Industry

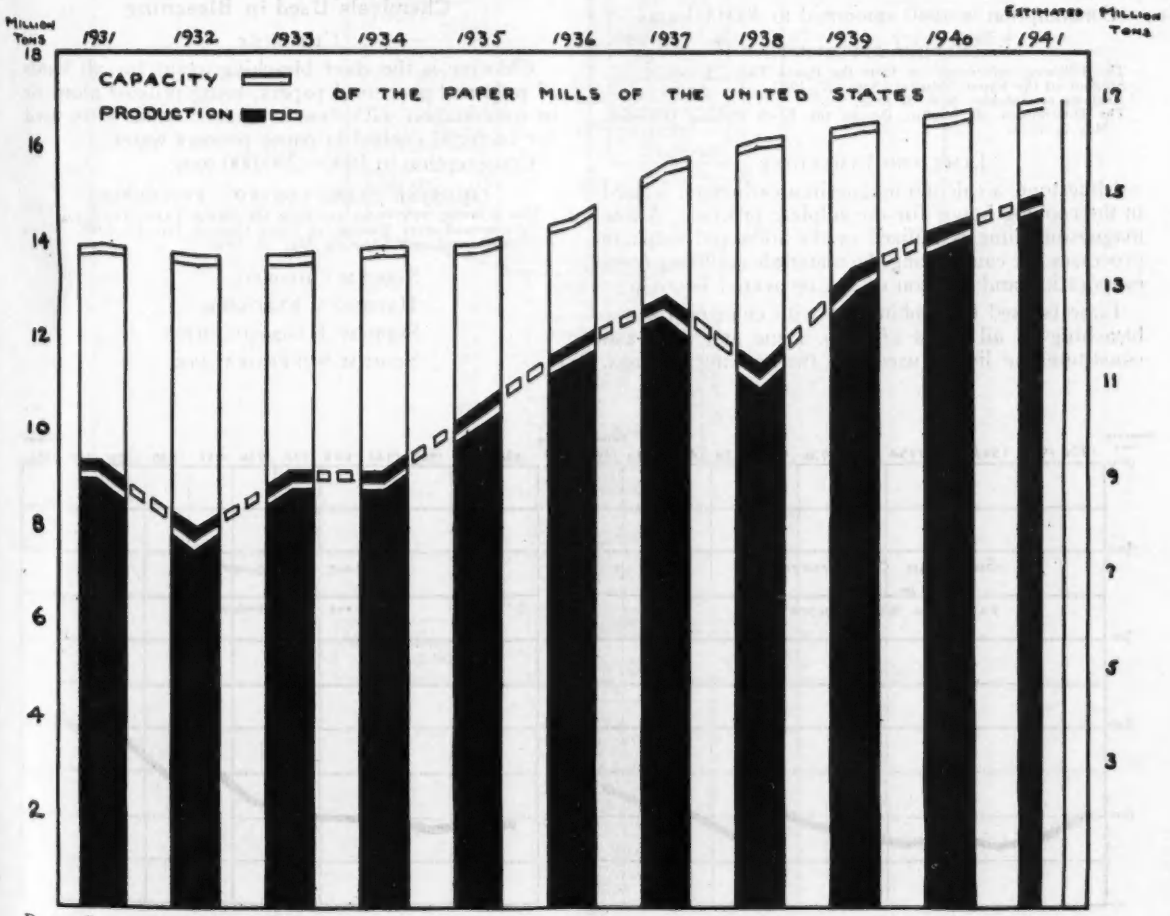
Written Especially for the Paper Trade Journal

By E. N. POOR
Technical Director, W. C. Hamilton & Sons, Miquon, Pa.

The American chemical industry has just completed the greatest year in its history, surpassing in volume the previous peak of 1937 by approximately 8%.

One of the largest contributing factors in chemical consumption has been the phenomenal growth of the pulp and paper industry. This is readily perceived from the fact that, whereas paper originated in this country 200 or more years after its inception in all other major countries, we now consume over 50% of the world's production. Perhaps the most important phase of this growth has been the rapid expansion of sulphate pulp production, and with its ever increasing versatility of product, its scope will continue to broaden.

The paper industry is unique in its diversification



RATED CAPACITY AND ACTUAL PRODUCTION OF THE PAPER MILLS OF THE UNITED STATES FOR THE YEARS 1931 TO 1941 INCLUSIVE.

of products from one basic raw material. These are continually replacing other materials in new fields of business activity as a result of research to make a product ideally adaptable to the desired application. This versatility of paper application has been made possible only through the use of many and varied kinds of chemicals. It is the purpose of this article to evidence the nature and extent of this chemical achievement.

Chemicals Used in Pulping Processes

Salt Cake

Salt cake or sodium sulphate is the chief component of the kraft or sulphate process for digesting wood. From 150-450 pounds per ton of finished pulp is utilized to maintain a uniform concentration of the cooking liquor. Consumption in 1940 was 450,000 tons.

SALT CAKE REFERENCES

The following references are from the Paper Trade Journal:
Analysis of Salt Cake, Nov. 2, 1933.
New Ideas on the Use of Salt Cake in Kraft Mills, Dec. 14, 1939.

Sulphur

Sulphur is used in the sulphite pulp process, forming with lime, the cooking liquor calcium bisulphite. Two hundred to three hundred pounds are consumed per ton of finished pulp.

Sintered mixtures of sulphur and soda ash are used as a substitute for salt cake in the sulphate pulp process.

Consumption in 1940 amounted to 400,000 tons.

SULPHUR REFERENCES

The following references are from the Paper Trade Journal:
Sulphur in the Paper Industry, Sept. 27, 1923.
Analysis of Sulphur, Nov. 3, 1932.
The Distribution of Sulphur During the Kraft Pulping Operation, May 2, 1935.

Lime and Limestone

Limestone, a calcium magnesium carbonate, is used in the cooking liquor for the sulphite process. A low magnesium lime is utilized in the soda and sulphate processes for causticizing the materials resulting from evaporation and ignition of the recovered liquors.

Lime is used in combination with chlorine for the bleaching of all kinds of pulp. Lime and soda ash constitute the liquor used for the cooking of rags. Lime only is employed in the digestion of straw to form strawboard.

Consumption in 1940—464,000 tons.

Caustic Soda

Caustic soda or sodium hydroxide constitutes the cooking liquor in the soda pulp process; is a component of the sulphate process liquor; is used in the digestion of soybean stems for use in strawboard; as treatment in bleaching sulphate pulp; with chlorine for the preparation of special bleaching compounds; in the de-inking of processed papers; for saponification of fatty acids as flotation agents in the treatment of white water; in the production of alpha pulp.

Consumption in 1940—50,000 tons.

CAUSTIC SODA REFERENCES

The following references are from the Paper Trade Journal:
Caustic Soda Solution, Jan. 28; Mar. 24, 1904.
Causticizing Soda Liquor, Oct. 17, 1917.
The Causticizing System in the Soda Mill, Oct. 26, 1922.
Analysis of Caustic Soda, July 7, 1932.
Caustic Soda and the Pulp and Paper Industry, Dec. 29, 1932.

Soda Ash

Soda ash or sodium carbonate is used for the reduction of sulphidity in sulphate cooking liquors; in the digestion of resinous woods for newsprint production; with sulphur in the sulphate process; in the saponification of rosin for size preparation; and on the grinding stones in the production of mechanical pulp.

Consumption in 1940—111,000 tons.

Chemicals Used in Bleaching

Chlorine

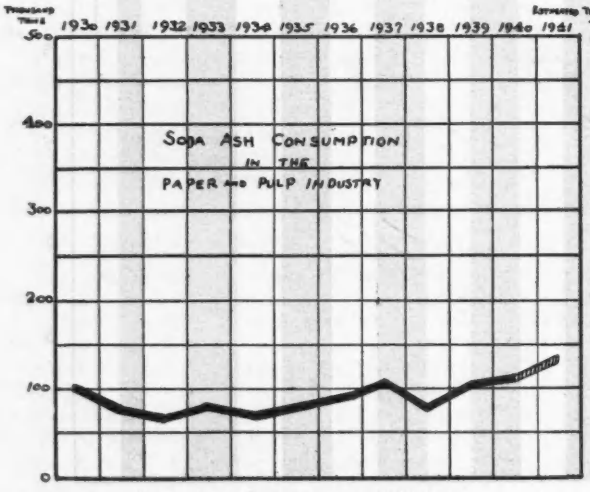
Chlorine is the chief bleaching agent for all kinds of pulp and processed papers, being utilized alone or in combination with lime or caustic soda. It is used for bacterial control in paper process water.

Consumption in 1940—200,000 tons.

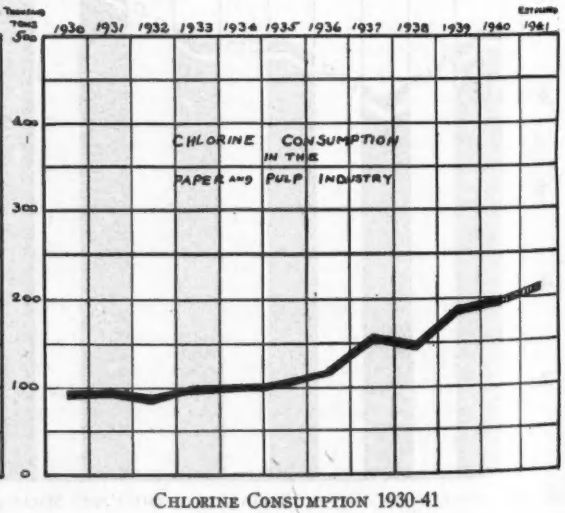
CHLORINE (SLIME CONTROL) REFERENCES

The following references are from the Paper Trade Journal:
Chlorine and other Methods of Slime Control, Jan. 10, 1929.
Slime Control with Chlorine, May 15, 1930.

Sodium Chlorite
Hydrogen Peroxide
Sodium Hydrosulphite
Sodium Sulphoxalate

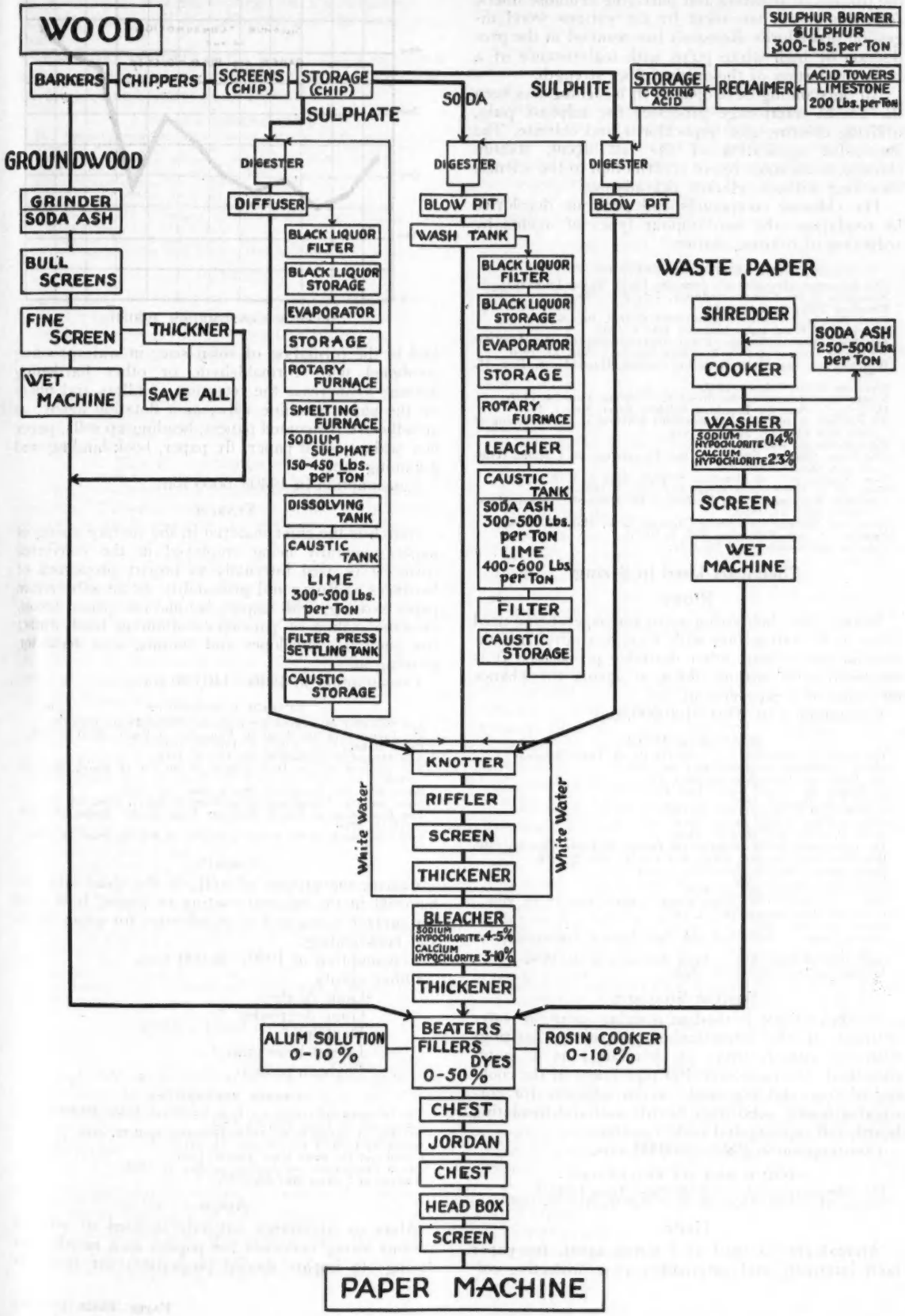


Soda Ash Consumption 1930-41



Chlorine Consumption 1930-41

CHEMICALS IN PULP AND PAPER PRODUCTION



The bleaching of wood pulp is a continuation of the process of isolating and purifying cellulose fibers, following initial treatment by the various wood digestion procedures. Research has resulted in the production of high white pulps with maintenance of a large proportion of the original fiber strength.

An outstanding development in bleaching has been the use of multi-stage processes for sulphate pulp, utilizing chlorine gas, hypochlorite and chlorite. The successful application of the last agent, sodium chlorite, is the most recent contribution to the science, bleaching without cellulose degradation.

The chlorine compounds and peroxide decolorize by oxidation—the two sulphur types of agents by reduction of coloring matter.

BLEACHING REFERENCES

The following references are from the PAPER TRADE JOURNAL:
Economics of the Chlorine Industry, July 29, 1926.
Bleaching Pulp, Aug. 16, 1906.
Batch Bleaching versus the Continuous System, July 8, 1926.
Bleaching of Wood Pulp, June 27; July 4, 1907.
Simplified Method for the Rapid Determination of the Available Chlorine Content of Pulp Bleaching Solutions, Aug. 13, 1936.
Bleaching of Rag Half Stock by Calcium Hypochlorite, Dec. 10, 1936.
Bleaching Kraft, Feb. 18, 1937.
Recent Developments in the Bleaching of Kraft, June 24, 1937.
Designing a Plant for Bleaching Sulphite Paper, July 1, 1937.
An Analysis of the Chemical Reactions Involved in the Bleaching of Pulp with Chlorine, May 11, 1938.
Pulp Bleaching, May 18, 1939.
The Lime Chlorine System in the Preparation of Calcium Hypochlorite, Dec. 7, 1939.
New Developments in Bleaching Sulphite, July 2, 1936.
What do we Know about Bleaching? June 4, 1936.
Limestone Examination and Evaluation for Bisulphite Liquor Manufacture, April 15, 1920.
Report on Methods for Testing Chemical Lime, Mar. 18, 1926.
Economy of Lime Reburning, Feb. 5, 1925.
Chlorine and Bleach, April 28, 1932.

Chemicals Used in Sizing

ROSIN

Rosin is the chief sizing agent for paper, being used alone or in conjunction with wax, to control ink absorption and impart other desirable properties. It is employed with various flotation agents to enhance efficiency of a recovery process.

Consumption in 1940—160,000 tons.

ROSIN REFERENCES

The following references are from the PAPER TRADE JOURNAL:
Effect of Sunlight on Rosin, May 14, 1925.
The Rosin and Rosin Size Industry, Oct. 30, 1919.
To Reduce the Cost of Rosin, June 22, 1911.
Rosin Size, Mar. 12, 1908.
Best Method of Sizing, Oct. 31, 1907.
Efficient Rosin Sizing, Feb. 7, 1918.
Rosin Size Theories, June 25, 1908.
The Influence of Rosin Sizing on the Quality of Paper, Oct. 23, 1913.
How Heat and Moisture Affect Rosin Size, July 2, 1908.
Rosin Sizing, May 17, 1906.
Rosin Size, Sept. 10, 1908.
Rosin Size in Paper, Jan. 3, 1907.
Historical Review of the Rosin Sizing of Paper, Oct. 11, 18, 1928.
Rosin and Rosin Sizing, Dec. 1, 1920.
Rosin, April 28, 1932.
Special Types of Rosin Size and Their Physical Properties, March 14, 1935.
Application of Rosin Size in Paper Making, June 13, 1929.
Analysis of Rosin, March 29, 1934.

SODIUM SILICATE

Sodium silicate is used as a sizing agent; a water softener; in the formation of greaseproof coatings with or without wax; in de-inking; as a water coagulant; for rust control in pipe lines; in the cooking of rope and rag stock; as an adhesive for corrugated board, solid fiber board, wall and insulating board, roll capping and carton sealing.

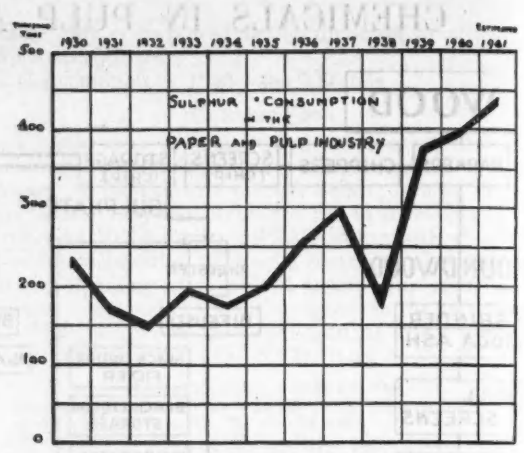
Consumption in 1940—200,000 tons.

SODIUM SILICATE REFERENCES

The following reference is from the PAPER TRADE JOURNAL:
The use of Sodium Silicate in Paper Making, Mar. 22, 1928.

GLUE

Animal glue is used as a sizing agent, for paper both internally and externally; as a protective colloid in the formation of rosin size; in waterproofing combined with formaldehyde or other hardening agents; to increase the retention of fillers and fibers on the paper machine wire; as a flotation agent; as an adhesive for coated papers, heading up rolls, paper box sealing, sand paper, fly paper, book-binding and gumming tape.



SULPHUR CONSUMPTION 1930-41

Consumption in 1940—6000 tons.

STARCH

Starch is the chief material in the surface sizing of paper, generally being employed in the converted form. It is used internally to impart properties of hardness, stiffness and printability, as an adhesive in paper coating, wall paper, lamination, paper boxes, machine sealing of packages containing food stuffs; for gumming envelopes and stamps, as a base for printing inks.

Consumption in 1940—140,000 tons.

STARCH REFERENCES

The following references are from the PAPER TRADE JOURNAL:
The Influence of Starch on the Properties of Paper, April 9, 1908.
Paper Makers Uses of Starch, July 13, 1922.
New Method of Surface Sizing, Oct. 5, 1916.
New Applications and Developments in the Use of Starch, April 23, 1936.
What May We Expect of Starch, Aug. 12, 1937.
Some Aspects of Starches in the Paper Industry, Sept. 23, 1937.
The Evaluation of Starch Products Used in the Beater and Tub, Feb. 4, 1937.
Effect of Starch on the Printing Quality of Boards, June 30, 1938.

CASEIN

Casein, the protein of milk, is the chief adhesive material in the mineral coating of paper. It is used for surface sizing and as an adhesive for paper boxes and bookbinding.

Consumption in 1940—26,000 tons.

Other agents:

Gum Arabic
Gum Accroider
Dextrin
Locust bean gum
Soybean protein.

CASEIN REFERENCES

The following references are from the PAPER TRADE JOURNAL:
Casein and its Uses, Feb. 13, 1913.
The Use of Casein in the Paper Industry, April 15, 1920.
Industrial Uses of Casein, Jan. 16, 1913.
Casein and Its Many Uses, June 7, 1906.
Casein Preparation and Application, Oct. 25, 1906.
Analysis of Casein, May 26, 1932.

ALUM

Alum or aluminum sulphate is used to activate various sizing materials for paper; as a mordant in dyeing; to impart special properties; for retention

of fillers and glues; in waterproofing as an acetate; as a catalyst in resin curing; in the treatment of process water; and for pH control in flotation processes.

The paper industry is the largest single consumer of alum, accounting for 450,000 tons annually, 40% of total United States consumption.

ALUM REFERENCES

The following references are from the PAPER TRADE JOURNAL:
Alum for Sizing, May 2, 1912.
Function of Alum in Sizing of Paper, Oct. 19, 1912.
Alum in the Paper Mill, Dec. 20, 1900.
Paper Makers Alum, July 2, 1925.
Sulphate of Alumina, June 17, 1920.
Testing Alum for Acid and Iron, Jan. 11, 1917.
The Fundamental Chemistry of Alum and its Application to Paper Manufacture, Jan. 12, 1939.
Sulphate of Alumina and Alums, Oct. 1, 1931.
Alum Feed for Paper Mill Waters, Oct. 6, 1932.

ENZYMES

Enzymes, or biological catalysts, of the diastatic type are used for the conversion of starch as tub or calender size. Proteolytic types find use in the recovery of specially treated papers, as glue and formaldehyde, etc.

Other activating materials:
Sodium Aluminate
Organic Acid Salts.

The Phenomenon of Sizing

Sizing is a treatment employed to make paper water resistant. Paper is sized in two ways, (a) internally, usually in the beater and (b) surface—after the paper is formed.

Rosin, the chief internal sizing agent, is generally used in the form of a sodium soap in water solution. There apparently is no general agreement as to the mechanism but evidence has led to the conclusion that particles of water resistant sizing material, precipitated by the activating agent, are deposited on the fiber surfaces, bound electrostatically by products resulting from the agent.

Surface sizing is accomplished by wetting the paper web, by spray or immersion, with a solution of the sizing material. In this way a thin coating is obtained which produces surface uniformity and hardness.

SIZING REFERENCES

The following references are from the PAPER TRADE JOURNAL:
Bleaching and Sizing, July 14, 1904.
Foaming of Sizing, Dec. 10, 1914.
Chemistry of Paper Sizing, July 18, 25, 1901.
Influence of Sizing on Paper, Sept. 25, 1913.
Hard Sizing and the Machine, May 14, 1908.
Reaction Between Pigment Loading Material and Sizing in Paper Pulp, Aug. 3, 1911.
How to Size and the Why and Wherefore, May 18, 1911.
Surface Sizing of Paper, Aug. 12, 1926.
The System of Rosin Size, Alum and Fibre as Related to Problems in Paper Sizing, Aug. 13, 1936.
A Review of the Literature of Sizing, July 27, Nov. 23, 30, 1933.
Aluminate Size, March 23, 1933.
Wax Sizing Compositions, Nov. 14, 1929.
Developments in the Preparation of Non-Fibrous Materials, June 16, 1932.

Fillers Used in Pulps

CLAY

China clay, an aluminum silicate, is used as a filler for pulps, to impart opacity, softness and printability. It is the main constituent of paper coating.

1940 consumption—480,000 tons—60% of domestic consumption.

CLAY REFERENCES

The following references are from the PAPER TRADE JOURNAL:
American Coating Clays, June 2, 1927.
Clay Milk and Colors, Aug. 25, 1921.
China Clay for Paper Making, Sept. 25, 1919.
Clays and Talc Used in the Manufacture of Paper, July 17, 1913.
Clay in the Beater Room, Nov. 1, 1917.
Clay Mining in the U. S., April 25, 1918.
Information as to Filler and Coating Clay, Dec. 17, 1925.
Notes on China Clay, Feb. 5, 1925.
The Retention of Clay in Paper, Sept. 28, 1916.
Recent Developments in Filler Clays, Aug. 5, 1937.
Southern Clays for Paper Making, Oct. 28, 1937.
Nature of China Clays, Sept. 9, 1937.
Method of Testing Clay, Talc and Agalite, March 14, 1929.
Domestic Clays for Paper, Oct. 3, 1929.
Clays and Fillers, April 28, 1932.

TITANIUM DIOXIDE

Titanium Dioxide is a filler for pulps, used to impart opacity to paper and board liners; increase brightness; increase covering power of coating mixtures; minimize the effect of oils, waxes and fats on the appearance of paper and board; reduce the yellowing of groundwood paper.

1940 Consumption—165,000 tons.

AMORPHOUS DIATOMACEOUS SILICA

Diatomaceous Silica is a filler for pulps, imparting bulk, increased ink absorption, brightness and improved filler retention.

TALC

Talc, a hydrous magnesium silicate, is a pulp filler.

Consumption 1940—31,000 tons.

BARIUM SULPHATE
CALCIUM SULPHATE

These materials are used as pulp fillers, alone or in combination with titanium dioxide.

Calcium Carbonate
Barium Carbonate
Zinc Sulphide
Zinc Oxide.

The filling or loading of paper with various materials is done primarily to enlarge the scope of paper application. Although it usually decreases the cost of manufacture, filler is, in general, used to impart certain desirable properties to paper, not otherwise obtainable.

The use of filler to improve opacity has permitted the printing of thin papers with a minimum of show through. The smooth and even surface of book papers; their ability to take fine half-tones, are secured by the use of large amounts of filler. Supercalendered finishes become more uniform and appealing when a filled paper is employed.

Filler is used in amounts up to 40% of the pulp furnish, depending upon the desired paper properties of opacity, color, softness and printability.

FILLERS REFERENCES

The following references are from the PAPER TRADE JOURNAL:
Retention of Fillers by Paper and Pulp, Oct. 4, 1917.
Progress in Paper Filling, Nov. 19, 1936.
Retention of Pigments in Paper, Jan. 9, 1936.
Factors Affecting Retention, Sept. 26, 1935.
Titanium Pigments, Nov. 19, 1936.
The Opacifying of Paper by Means of Titanium Pigments, Sept. 21, 1933.
Use of Titanium Pigments in the Paper Industry, Sept. 7, 1933.
Zinc Sulphide in Today's Paper Industry, March 15, 1934.
The Properties of Paper Pigmented with Zinc Sulphide, May 15, 1933.
The Use of Zinc Sulphide Pigments in the Paper Industry, March 9, 1933.
Analysis of Mineral Fillers, July 7, 1932.

Dyestuffs

Dyestuffs are used for paper coloring in the beater, at calender, combinations of the two, by dipping and continuous methods. Many kinds of dyes are utilized depending upon properties of light fastness, brilliance, retention, etc.

MINERAL PIGMENTS
Ultramarine
Iron Oxide
Lead Chromate
Ferric Ferrocyanide

Copper Carbonate
Cadmium Sulphide

ANILINE DYE PIGMENTS

ANILINE DYES
Basic, acid and direct

CARBON BLACK

MORDANTING AGENTS
Alum
Tannic Acid
Tartar emetic
Boric acid.

DYES REFERENCES

The following references are from the PAPER TRADE JOURNAL:
Improving the Fastness of Dyes to Light when Applied to Paper, May 27, 1926.
Effect of Temperature and Salting-Out Agents on the Retention of Dyes by Paper and Pulp, Aug. 10, 1932.
Coloring of Paper, Feb. 6, 1913.
Colors and Their Use in Papermaking, Dec. 16, 1916.
Coloring of Pulp and Paper, Aug. 18, 1910.
Paper Coloring, May 13, 1926.
Application of Direct Dyes in Coloring Paper, Feb. 8, 1923.
Notes on Paper Dyeing, May 9, 1912.
Dyeing of Paper, July 30, 1908.
Analysis of Dye Situation as Related to Paper Making, Sept. 30, 1915.
Coloring Matter for Coated Paper, April 12, 1923.
Basic Colors for Dyeing Paper, Aug. 2, 1928.
Mordants, June 5, 1902.
Color and Its Application to the Paper Industry, July 14, 1938.
Classes of Colors Used in the Dyeing of Paper, April 2, 1931.
Dyes and Pigments, April 28, 1932.

Chemicals for Special Treatment of Paper

GLYCERINE

Glycerine is used as a plasticizing agent for various kinds of paper; with glue and formaldehyde for saturating papers.

Consumption in 1940—6000 tons.

GLYCERINE REFERENCES

The following reference is from the PAPER TRADE JOURNAL:
Glycerine in Paper, July 13, 1939.

SULPHURIC ACID

Sulphuric acid is used in the production of parchment paper; to neutralize water alkalinity in the beater; and for acid bleaching.

WAX

Paraffin and amorphous petroleum waxes are used for paper sizing, internal or external, to impart water resistance, scuff resistance, pliability, control of ink absorption, and lactic acid resistance.

RESINS

Water soluble urea-formaldehyde resins are supplied to paper for increasing wet tensile and rub; water dispersed, pre-cured, pre-polymerized alkyds, urea-formaldehyde, phenol formaldehyde, vinyls, acryloids, for water resistance, wearability, scuff resistance; water soluble polyvinyls and cellulose ethers for film forming properties and grease resistance; various resins as adhesives for paper boxes.

FORMALDEHYDE REFERENCES

The following reference is from the PAPER TRADE JOURNAL:
Analysis of Formaldehyde, Nov. 26, 1931.

Special Papers by Name

CARBON
Distilled fatty acids
Carbon black

COATED
Aluminum flake
Bronze powder
Magnesium chloride
Magnesium sulphate
Manganese sulphate
Satin white-aluminum hydroxide plus calcium sulphate

COATING REFERENCES

The following references are from the PAPER TRADE JOURNAL:
Coloring Matter for Coated Papers, April 12, 1933.
How Coated Papers are Made, Feb. 7, 1918.
Origin of Coated or Enameled Book Paper, July 3, 1919.
Progress in Coated Papers, Feb. 8, 1906.
Transparent Colored Coatings, May 28, 1903.
Manufacture of Coated Paper, June 9, 1921.
Increasing the Suspension of Coating Mixtures by the Addition of Colloids, Feb. 25, 1926.
The Coating Mill Chemist, Oct. 1, 1936.
Developments in the Preparation of Coating Color Moistures, July 2, 1936.
Dispersion of a Coating Mix, Aug. 6, 1936.
Sulphonated Oil in Paper Coating Processes, Dec. 30, 1937.
Roll Coating Process, July 29, 1937.
A Comparison of Modern Methods of Coating Paper, June 30, 1938.
A Study of Calcium Carbonate, Clay and Casein Coating Mixtures Affecting Certain Sheet Characteristics, Sept. 14, 1939.
The Ortho Chrome Process of Coating Paper, Oct. 19, 1939.
The Novak Wet Web Process, April 6, 1939.
Paper Machine Coating Processes, Oct. 19, 1939.
Dry Coating of Paper, Sept. 21, 1939.

WATERPROOF
Formaldehyde—also as a preservative for proteins.
Calcium resinate
Diglycal stearate
Tri-ethanolamine
Stearine
Ammonium salts-resin curing catalysts

PARCHMENTIZED AND FIREPROOF
Zinc chloride
Ammonium Sulfamate

ROOFING
Feldspar
Asphaltum

ABRASIZE
Bauxite

TRANSPARENT AND TRACING
Balsam

INSULATING
Asphaltum

GUMMING
Sulphonatedalkyd esters

TOWELS
Wetting agents

Miscellaneous Chemicals

FLOTATION AGENTS
Tall oil
Fatty acids

FELT WASHERS
Sulphated alcohols
Soaps
Tri-sodium phosphate
Tetra sodium pyrophosphate

WATER SOFTENER—RUST INHIBITOR
Sodium hexa-meta phosphate

PLASTICIZERS
Sorbitol
Invert sugars
Sulphonated oils

AGENTS FOR BACTERIAL CONTROL
Chlorophenates

ANTICHLORS
Sodium hyposulphite
Sodium bi-sulphite
Sodium sulphite

FOAM KILLER
Sulphonated tallow

PITCH DISPERSANTS
Salts of organic acids
Sulphonated oils

Supplementary List

CARBON TETRACHLORIDE is used as a non-inflam-

mable solvent for lacquered and coated papers. It is the base of many cleaning compounds.

COPPER SULPHATE is used as a coagulant in the treatment of process water.

MURIATIC ACID is used to produce acidity in certain acid bleaching processes.

SODIUM TRI-PHOSPHATE used for felt washing—listed in report.

SODIUM TETRA PYROPHOSPHATE is used in the softening of water without precipitation—as a sequestering agent for iron and other undesirable elements in bleaching processes—as a corrosion inhibitor—as a dispersing agent in felt cleaning.

SODIUM THIOSULPHATE is Sodium Hyposulphite.

SULPHUR DIOXIDE results from burning of sulphur in the sulphite pulp process. It is used in bleaching of various pulps and groundwood by reduction.

SODIUM BORATE (tetra) is used as the alkaline dissolving medium for casein in surface sizing.

SODIUM SULPHITE is an antichlor and a reducing bleach used with chemical pulps and groundwood.

ACETIC ACID is used for permanizing the color of paper. As aluminum acetate, it is used in waterproofing as a surface application.

AMMONIA (Anhydrous) is used extensively in the bacteriological treatment of water to prolong the germicidal effect of chlorine.

AMMONIUM HYDROXIDE is used as a preservative for latex and casein.

ANTI-FOAMING AGENTS. Sulphonated tallow and various sulphonated oils are used to eliminate foam in both pulp and paper mills. They are employed both in the wet pulp and surface sizing solutions, as glue, etc.

LATEX is used for the impregnation of porous papers to form a base for artificial leather to enhance the ability to hold stitching and nailing. It is used for coagulation in the beater to increase fold or water resistance, for flexible lamination, for cohesive coating, for water resistant coatings, as an adhesive media. Availability of latex governs its use and artificial aqueous dispersions possessing many of the qualities of latex are now available and serve adequately.

LATEX REFERENCES

The following references are from the PAPER TRADE JOURNAL:
Rubber Latex in Paper Making, Aug. 14, 1924.
Durability of Paper Sized with Rubber Latex, Aug. 28, 1924.
Rubber Latex as Paper Size, Aug. 14, 1924.
Latex in Paper Making, March 9, April 27, Aug. 24, 1922.
Rubber Latex in Paper, Dec. 28, 1922.
Use of Rubber Latex in Paper Manufacture, March 9, 1922.
Saturation of Absorbent Papers with Rubber Latex, Oct. 28, 1937.
Growing Utilization of Latex in Paper Making, Dec. 28, 1933.
Liquid Latex and the Paper Industry, July 7, 1932.
Use of Latex in the Beater, April 13, 1933.
Latex Sizing by the Beater Method, May 31, 1928.
Applications of Rubber to Paper Fibers, Dec. 20, 1934.

C. P. ACIDS are used as laboratory reagents in analytical work.

ZINC SULPHATE is used to impregnate alpha cellulose to produce papers for electrical winding and as a special coagulating agent for process water.

SODIUM SULPHATE in addition to its use in the sulphate pulping process, is added to boiler feed water to increase sulphate-carbonate ratio.

SODIUM PHOSPHATE, de-basic is a water softener.

SOURCES OF SUPPLY OF CHEMICALS AS ADVERTISED IN PAPER TRADE JOURNAL AND LOCKWOOD'S DIRECTORY

ALUMINUM SULPHATE
American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York, N. Y.
E. I. duPont deNemours & Co., Grasselli Chemicals Dept., Wilmington, Del.
Charles Lennig & Co., 222 W. Washington Sq., Philadelphia, Pa.
Monsanto Chemical Co., 1700 S. 2nd St., St. Louis, Mo.
Penna. Salt Mfg. Co., Widener Bldg., Philadelphia, Pa.
Papermakers Chemical Division—Hercules Powder Corp., Wilmington, Del.

AMMONIUM HYDROXIDE
E. I. duPont deNemours & Co., Grasselli Chemicals Dept., Wilmington, Del.

AMYL ACETATE
Monsanto Chemical Co., 1700 S. 2nd St., St. Louis, Mo.

ANILINE
Dow Chemical Co., Midland, Mich.
Monsanto Chemical Co., 1700 S. 2nd St., St. Louis, Mo.

ANTIFOAMING AGENTS
E. I. duPont deNemours & Co. Organic Chemicals Dept. Fine Chemicals Div., Wilmington, Del.

AQUEOUS DISPERSIONS OF CARBON BLACK
United Carbon Co., Inc., Box 1475, Charleston, W. Va.

ASPHALTUM
Wishnick-Tumpeer, 295 Madison Ave., New York, N. Y.

BARIUM CARBONATE
American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York, N. Y.
E. I. duPont deNemours & Co., Grasselli Chemicals Dept., Wilmington, Del.
Wishnick-Tumpeer, 295 Madison Ave., New York, N. Y.

BARIUM CHLORIDE
American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York, N. Y.
E. I. duPont deNemours & Co., Inc., Grasselli Chemicals Dept., Wilmington, Del.
Wishnick-Tumpeer, 295 Madison Ave., New York, N. Y.

BAUXITE
American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York, N. Y.

BENTONITE
American Colloid Co., 363 W. Superior St., Chicago, Ill.
American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York, N. Y.
Edgar Brothers Co., 50 Church St., New York, N. Y.
United Clay Mines Corp., Trenton, N. J.
Wishnick-Tumpeer, 295 Madison Ave., New York, N. Y.
Wyodak Chemical Co., 4600 E. 71 St., Cleveland, Ohio

BLANC FIXE
American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York, N. Y.
E. I. duPont deNemours & Co., Grasselli Chemicals Dept., Wilmington, Del.

BLEACHING POWDER
Electro Bleaching Gas Co., 60 E. 42nd St., New York, N. Y.
E. I. duPont deNemours & Co., Grasselli Chemicals Dept., Wilmington, Del.
Penna. Salt Mfg. Co., Widener Bldg., Philadelphia, Pa.

BORIC ACID
The Glidden Co., Union Commerce Bldg., Cleveland, Ohio
Wishnick-Tumpeer, 295 Madison Ave., New York, N. Y.

BROWN OXIDE
Binney & Smith Co., 41 E. 42nd St., New York, N. Y.

BUTYL ACETATE
Monsanto Chemical Co., 1700 S. 2nd St., St. Louis, Mo.

CADMIUM SELENIUM REDS
The Glidden Co., Union Commerce Bldg., Cleveland, Ohio

CADMIUM SULPHIDE
Wishnick-Tumpeer, 295 Madison Ave., New York, N. Y.

CADMIUM YELLOWS
The Glidden Co., Union Commerce Bldg., Cleveland, Ohio

CALCIUM CARBONATE
American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York, N. Y.
Wishnick-Tumpeer, 295 Madison Ave., New York, N. Y.
Michigan Alkali Co., Inc., 60 E. 42nd St., New York, N. Y.

CALCIUM CHLORIDE
Michigan Alkali Co., Inc., 60 E. 42nd St., New York, N. Y.
Solvay Sales Co., 40 Rector St.
Dow Chemical Co., Midland, Mich.

CARBON BLACK
Binney & Smith Co., 41 E. 42nd St., New York, N. Y.
United Carbon Co., Inc., Box 1475, Charleston, W. Va.
Wishnick-Tumpeer, 295 Madison Ave., New York, N. Y.

CASEIN
American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York, N. Y.
Casein Co. of America, 350 Madison Ave., New York, N. Y.

CHLORINE
American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York, N. Y.
Electro Bleaching Gas Co., 60 E. 42nd St., New York, N. Y.
Michigan Alkali Co. (Inc.), 60 E. 42nd St., New York, N. Y.
Monsanto Chemical Co., 1700 S. 2nd St., St. Louis, Mo.
Penna. Salt Mfg. Co., Widener Bldg., Philadelphia, Pa.
Solvay Sales Co., 40 Rector St., New York, N. Y.
Wishnick-Tumpeer, 295 Madison Ave., New York, N. Y.
Columbia Chemical Div., 30 Rockefeller Plaza, New York, N. Y.

CLAYS
American Colloid Co., 363 W. Superior St., Chicago, Ill.
American Cyanamid & Chemical Corp., 30 Rockefeller Pl., New York, N. Y.
English China Clays Sales Corp., 551 5th Ave., New York, N. Y.
Edgar Brothers Co., 50 Church St., New York, N. Y.
International Pulp Co., 41 Park Row, New York, N. Y.
United Clay Mines Corp., Trenton, N. J.
W. H. Loomis Talc Corp., Gouverneur, N. Y.
R. T. Vanderbilt Co., Inc., 230 Park Ave., New York, N. Y.

Paper Makers Importing Co., Easton, Pa.
C. K. Williams & Co., Easton, Pa.
Georgia Kaolin Co., New York Central Bldg., New York, N. Y.
Wishnick-Tumpeer, 295 Madison Ave., New York, N. Y.
Wyodak Chemical Co., 4600 E. 71st St., Cleveland, Ohio

DEXTRIN
Stein Hall & Co., Inc., 285 Madison Ave., New York, N. Y.
Stein Hall Mfg. Co., 2841 S. Ashland Ave., Chicago, Ill.

DIETHYLANILINE
Dow Chemical Co., Midland, Mich.

DYES
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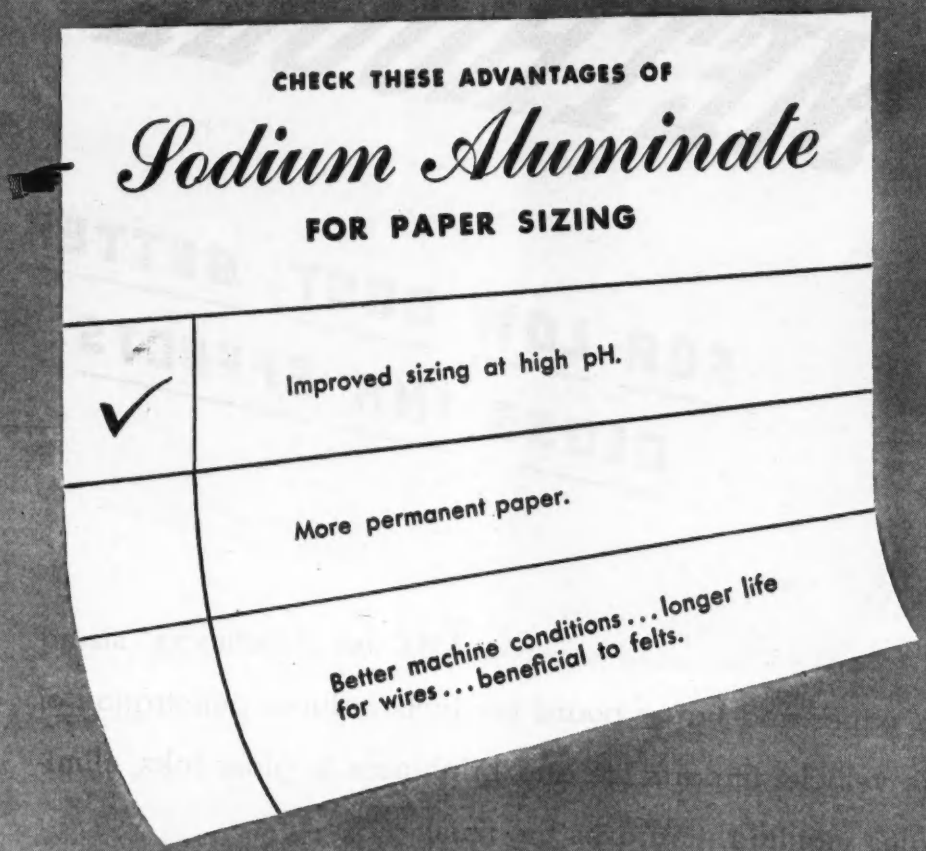
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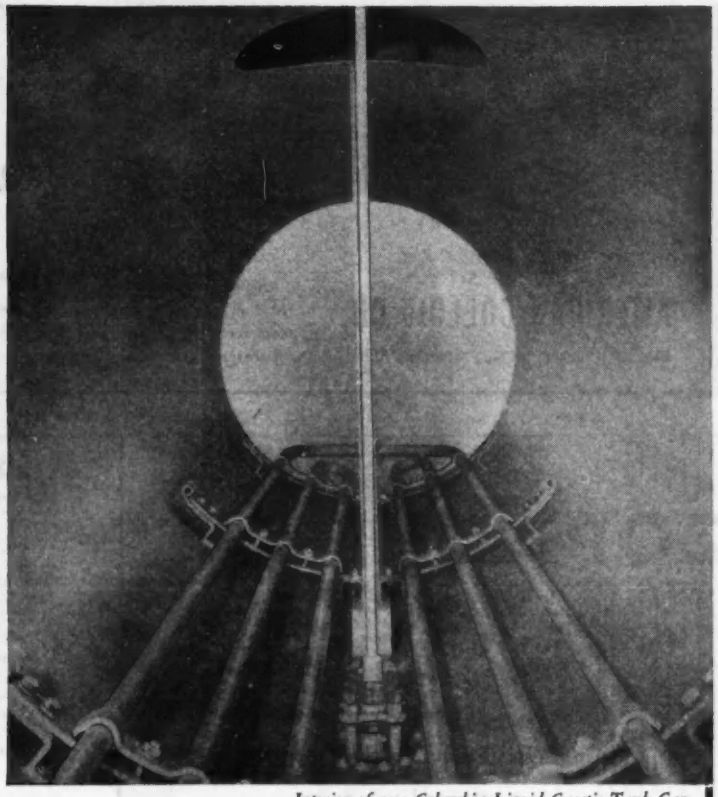

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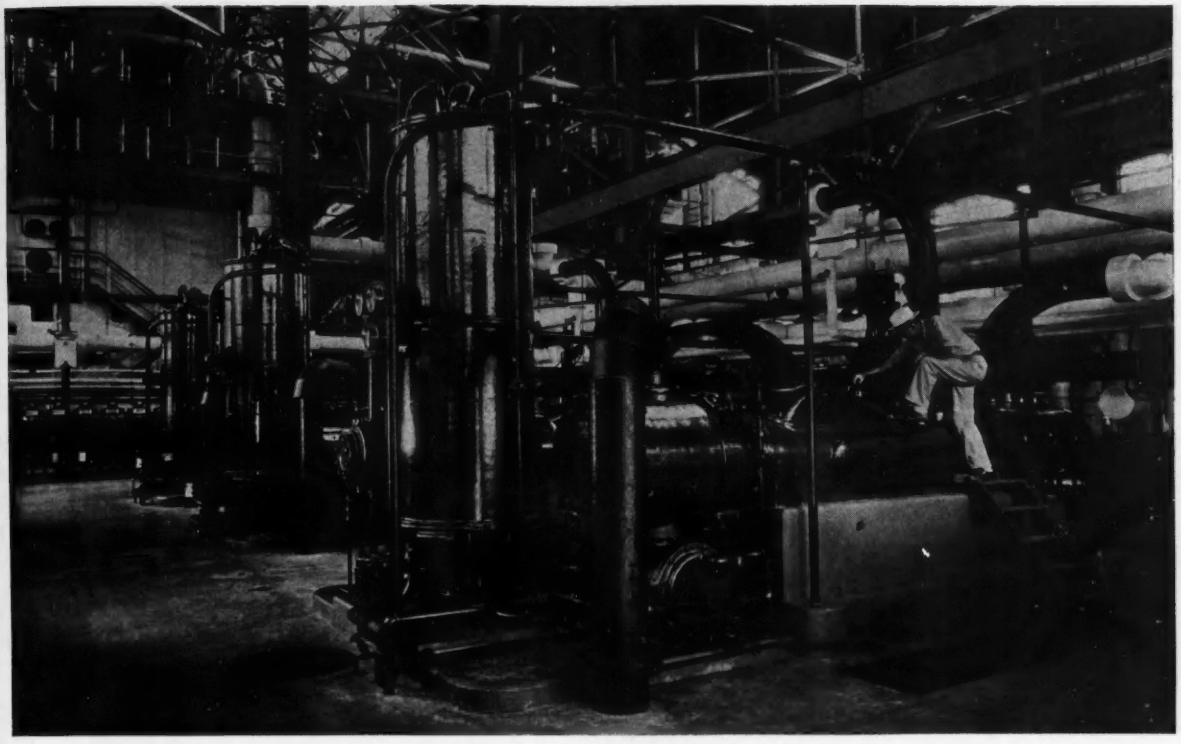

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Buy Paper Under Walsh-Healey Act

WASHINGTON, D. C., May 28, 1941—During the week ended May 10, various government departments purchased $78,022.93 worth of paper and allied products under the Walsh-Healey Act.

As announced by the Public Contracts Board of the Department of Labor the awards included the following: Bogart Paper Company, $48,680.48 worth of toilet paper for the QMC, War Department, Brooklyn, N. Y.; and John Crompton-Adelphia, Corporation, $29,342.45 worth of packing cartons.

Prizes for Boston Paper Men's Outing

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., May 26, 1941.—In addition to prizes which will be awarded to winners in golf and sports at the Summer Outing of the Boston Paper Trade Association, to be held at Charles River Country Club, Newton Centre, Mass., Monday, June 9, the executive committee has provided for ten door prizes, winning numbers to be drawn from a hat after dinner. No one winning an individual prize at golf, putting or sports will be allowed to take a door prize. The holders of the lucky numbers must be on hand, in person, to collect their prizes when drawn, otherwise another drawing will be made.

An addition has also been made to the sports program. A. T. Carter, chairman of the outdoor sports committee, has made arrangements for tennis. Courts will be available to all who wish to play, at 50 cents an hour.

The general program includes a regular buffet luncheon at the Locker Building from 11:30 A.M. on. The outdoor sports, besides the tennis, include horseshoes, with Hubert Lockhart in charge; putting, F. W. Masselink in charge; bowling, J. A. Andrew, Jr., and ball game, David Cheever.

In golf, with W. J. McLellan, chairman, Nelson Feeley, Floyd Blackman, and W. Edwin Porter, Jr., as committee, there will be 18 holes, four-ball only, and medal play. Prizes are offered in Class A Handicap, 20 and under, for first gross, first net (Challenge Cup), second net, and third net; Class B Handicap, 21 to 28, first gross, first net, second net, and third net; Class C Handicap, 28 and over, best selected nine holes. Class B can play for championship cup by relinquishing their handicap and accepting 20 rating. A prize is offered for guest's handicap tournament, for guests only.

Goes with Frost-White Paper Co.

[FROM OUR REGULAR CORRESPONDENT]

CARTHAGE, N. Y., May 26, 1941—Announcement is made here of the resignation of G. Elmer Emigh as superintendent of the National Paper Products Company, a subsidiary of the Crown-Zellerbach Corporation to become effective immediately. On June 1 he will take over his new duties as superintendent of the Frost-White Paper Company, Inc., at Salisbury Mills, N. Y. He has already worked in paper mills in nine states, starting his career at the age of thirteen at York Haven, Pa. For about a year he served as superintendent of the Crown-Zellerbach branch at Camas, Wash., being transferred to the plant here in 1932.

Tribute to Paper Industry

In an address before the convention of the National Association of Purchasing Agents, held at Chicago on May 27, Leon Henderson, administrator of the Office of Price Administration and Civilian Supply, paid the following tribute to George A. Renard, executive secretary of the association:

"We drafted him very early to handle a matter of paper prices for us. If we never have any more trouble with a commodity than we have had with those prices under his general supervision, there would be no occasion for a far-flung OPACS organization."

CONSTRUCTION NEWS

Detroit, Mich.—The Detroit Sulphite Puip and Paper Company, 9125 West Jefferson avenue, manufacturer of coated and other paper stocks, tissue papers, etc., has approved plans for new addition to mill for expansion in main operating division. It will be one-story type. No estimate of cost has been announced. General erection contract has been awarded to W. J. C. Kaufmann Company, 10610 Shoemaker street, Detroit, and work is scheduled to begin at once.

Stevens Point, Wis. — The Whiting-Plover Paper Company, manufacturer of writing and other paper stocks, has plans for addition to steam power house at mill, consisting of a building equivalent to three-story in height, 32 x 52 feet. Increased capacity will be carried out with installation of new boiler unit and auxiliary equipment. Cost is reported over $750,000, including equipment. Bids have been asked on general erection contract and award will be made soon. Helmick, Edeskuty & Lutz, Essex Building, Minneapolis, Minn., are consulting engineers.

Cloquet, Minn.—The Wood Conversion Company, manufacturer of insulating board, building board, etc., has begun erection of new addition to mill, previously referred to in these columns, consisting of a one-story structure, about 58 x 315 feet to be used for expansion in dryer building; work will include improvements in present structure. Cost reported about $100,000, with equipment. Structural steel framing will be furnished by the American Bridge Company, Wolvin Building, Duluth, Minn. Thomas J. Shefchik, Lonsdale Building, Duluth, is architect.

St. Louis, Mo.—The Ajax Corrugated Paper Company, 3600 North Second street, manufacturer of corrugated boxes and containers, has approved plans for new one-story plant for expansion in main production facilities, to be located on corner plot at North Broadway and Taylor avenue. It will be 100 x 400 feet, reported to cost close to $150,000, with equipment. Installation will include mechanical-handling facilities for truck-loading and other service; unit heaters and complete sprinkler system will be installed. It is understood that present works will be removed to new location as soon as building is ready for occupancy. General erection contract has been let to Murch-Jarvis, Inc., 111 North Fourth street, St. Louis, and work will be placed under way at once. Hari Van Hoefen, 408 Pine street, St. Louis, is architect.

Grand Rapids, Mich.—The American Box Board Company, manufacturer of box board, test liners, paper boxes and containers, has concluded arrangements for purchase of former local factory of Nachman Spring-Filled Corporation, totaling close to 130,000 square feet of floor space, and will improve and occupy at once for expansion. Part of available space will be used for paper box-manufacturing division, and remainder for storage and distribution.

St. Joseph, Mo.—The Western Tablet and Stationery Company, 11th street and Mitchell avenue, manufacturer of commercial and other paper products, writing tablets, etc., has approved plans for new addition to plant for large increased capacity in paper-converting department. It will be six-story and basement, constructed in two sections, 160 x 225 feet, and 54 x 140 feet. Cost estimated close to $350,000, including equipment. Construction contract has been awarded to Lehr Construction Company, Twenty-second and Frederick streets, St. Joseph, which will begin work at early date. John S. Metcalf Company, 111 West Jackson boulevard, Chicago, Ill., is consulting engineer.

Riverton, Conn.—The Setag Paper Mills, Inc., manufacturer of kraft paper products, is considering early rebuilding of portion of local mill destroyed by fire, May 21, with loss reported at $75,000, including equipment.

Chicago, Ill.—The United Autographic Register Company, 59 East Van Buren street, manufacturer of commercial paper products, business forms, etc., has approved plans for new addition to plant at 5000 South California avenue, to be one-story, 145 x 155 feet, estimated to cost over $100,000, with equipment. General erection contract has been awarded to the E. W. Sproul Construction Company, 2001 West Pershing road, Chicago, and work will be placed under way at once. Morton L. Pereira & Associates, Inc., 100 West Monroe street, are architects.

Richmond, Va.—E. I. du Pont de Nemours & Co., Rayon Division, du Pont Building, Wilmington, Del., has approved plans for large addition to cellulose rayon mill at Ampthill, near Richmond, consisting of a multi-story unit, reported to cost over $500,000 with machinery. Construction is scheduled to begin soon; contract for structural steel framing has been awarded to the Harris Structural Steel Company, Plainfield, N. J.

Polson, Mont.—Interests represented by L. A. DeGuerre, Wisconsin Rapids, Wis., paper mill engineer, have plans maturing for a new pulp and paper mill at Polson, originally projected a number of months ago. Options on neighboring timberlands are being taken for a ten-year period, to be used for pulpwood supply, and complete surveys are being made for proposed plant. It will consist of several large one and multi-story units for pulp division and finishing mill, with storage and distributing building, power house, pumping station, machine shop and other structures. Entire project is reported to cost in excess of $2,500,000, with equipment. J. E. Busey, L. L. Marsh and Lloyd Helmer, all of Polson, are interested in the project, as are a number of city officials. T. R. Delaney, Polson, attorney, is representative for proposed new company which will carry out the development.

Los Angeles, Calif.—The Lily-Tulip Cup Corporation, 3000 East 12th street, manufacturer of paper cups and kindred specialties, has completed plans for new addition to plant, consisting of a one-story building, 90 x 152 feet, to be used for storage and distributing service. It is estimated to cost about $50,000 with equipment. Erection contract has been awarded to William P. Neil Company, 4814 Loma Vista avenue, Los Angeles. Harry T. Miller, last noted address is architect.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending May 28, 1941

	High	Low	Last
A. P. W.	....	....	....
Armstrong Cork Co.	25¾	23	23
Celotex Corp.	9¼	8¾	9¼
Celotex Corp., pf.	67½	67½	67½
Certain-Teed Products Corp.	3	2⅞	3
Certain-Teed Products Corp., pf.	25½	23¼	25½
Champion Paper & Fibre Co.	18⅜	18¼	18¼
Champion Paper & Fibre Co., pf.	104	104	104
Congoleum-Nairn Co.	15⅛	15	15
Container Corp. of America	13⅜	13	13¼
Continental-Diamond Fibre Co.	8	7½	8
Crown-Zellerbach Co.	12	11⅝	11⅝
Crown-Zellerbach Co., pf.	85	83½	84
Flintkote Co.	12½	12¼	12½
Robert Gair	1⅜	1¼	1¼
Robert Gair, pf.	8⅝	8⅜	8⅝
International Paper & Power Co.	14⅜	13¾	14¼
International Paper & Power, pf.	69	66	68⅝
Johns-Manville Corp.	59	57½	57½
Johns-Manville Corp., pf.	....	....	....
Kimberly Clark Corp.	....	....	....
MacAndrews & Forbes	....	....	....
MacAndrews & Forbes, pf.	134½	134½	134½
Masonite Corp.	20	19	19½
Mead Corp.	8	7⅞	8
Mead Corp., pf.	66⅜	66¼	66¼
Paraffine Companies, Inc.	27	27	27
Paraffine Companies, Inc., pf.	101	101	101
Rayonier, Inc.	12	11⅝	11⅝
Rayonier, Inc., pf.	25	23¼	23⅝
Ruberoid Co.	15¾	15½	15¾
Scott Paper Co.	34¼	33⅞	33⅞
Scott Paper Co., pf.	110⅛	108½	108½
Sutherland Paper Co.	18⅞	18⅞	18⅞
Union Bag & Paper Corp.	10¾	10¼	10¼
United Paperboard Co.	3	2¾	2¾
U. S. Gypsum Co.	58½	57	57½
U. S. Gypsum Co., pf.	175	174¼	174¼

New York Curb Exchange

High, Low and Last for Week Ending May 28, 1941

	High	Low	Last
American Box Board Co.	4¼	4¼	4¼
Brown Co., pf.	....	....	....
Great Northern Paper Co.	39	39	39
Hummel-Ross Fibre Corp.	5¼	5⅛	5¼
National Container Corp.	11⅛	10⅝	10⅝
St. Regis Paper Co.	1⅞	1¾	1¾
St. Regis Paper Co., pf.	88½	87⅛	87⅛
Taggart Corp.	2½	2½	2½

Wants Tax Assessment Reduced

WATERBURY, Conn., May 26, 1941—The Waterbury Corrugated Container Company, with land and property on Thomaston avenue, assessed at $209,350 by Waterbury tax commissioners, has asked superior court for a writ of mandamus ordering the tax commissioners to revise the assessment to comply with a court order of Sept. 13, 1940, placing the assessment value at $149,350.

The request is made through State's Attorney William B. Fitzgerald for the company, against tax commissioners John Jenusaitis, Frederick W. Palomba, Jan Kilduff, and Joseph H. McGinniss. Humbert E. Mangini as tax collector for the city, was also named in the writ.

According to the complaint, the board of tax commissioners placed an assessed valuation on the property at $209,350 as of the taxing date May 1, 1939. From this assessment, the Corrugated company instituted a civil action against the city, and on September 13, 1940, the Waterbury superior court ruled that the assessment be reduced by $50,000.

On this basis the company paid its tax bill and received a receipt therefore, but on May 6, 1941, the tax collector again placed an assessed valuation of $209,350 on the property, obviously in disregard of the court's revision of assessment.

Stating that the company has no other recourse to law, the relator (Corrugated Container Company) asks the court to issue a writ of mandamus ordering the members of the tax commission to correct the error and issue a proper tax bill, as determined by the court.

Robert E. Read, Inc. Sold

DEXTER, N. Y., May 26, 1941—A bankruptcy sale of Robert E. Read, Inc., was held here this week at which Byron S. Miller, of Florida, bid in the mill, water power rights and equipment plus a few incidentals for $20,965. The sale was conducted by O. Palmer Barnes, trustee of the assets of the concern while Judge John Conboy, referee in bankruptcy, was also in attendance. While there was a large attendance at the sale there were no bidders against Mr. Miller. It is understood that he plans to reorganize the business and resume operations along the plans originally intended by Mr. Read. The company manufactured molded pulp products. The company was organized in the winter of 1936 and went into bankruptcy this year with total liabilities of $160,682, of which Mr. Miller held $134,119.

Paraffine Votes Dividends

A regular quarterly dividend of $1 per share on preferred stock, and a dividend of 50 cents per share on common stock, were declared today by directors of The Paraffine Companies, Inc.

The preferred dividend is payable July 15, 1941, to stock of record July 1, 1941, and the common dividend is payable June 27, 1941, to stock of record June 10, 1941.

National Container Profits Up

National Container Corporation for the March quarter reports a net profit of $225,618, equal to 68 cents each on 330,482 shares of common stock, compared with $202,117, or 61 cents a share, in the first quarter of 1940. Sales were $1,908,795 against $1,566,597.

Dominion Envelope Nets 65 Cents

The Dominion Envelope and Cartons Western, Ltd., for 1940 reports a net income, in Canadian currency of $57,653, equal to 65 cents each on 36,250 shares of common stock, compared with $63,088, or 80 cents a share, in 1939.

A. P. W. Properties Nets $8,583

A. P. W. Properties, Inc. (controlled by A. P. W. Paper Company) reports for the March quarter a net income of $8,583. Nine months to March 31, net income was $16,598.

Fir-Tex Earns $1,529

Fir-Tex Insulating Board Company for 1940 reports a net income of $1,529, in contrast to a net loss of $68,039 in 1939.

International Nets $3,546,822

Richard J. Cullen, president, in submitting to stockholders the statement of consolidated profit and loss of International Paper and Power Company and subsidiary companies for the first quarter of 1941, says:

"Increases in United States income and excess profits taxes applicable to operations from January 1, 1941 are now under discussion before Congressional committees. A special reserve of $500,000 for such increased taxes has been created as the Company's exact liability cannot be determined until the new revenue law has been enacted. After deduction of this special reserve, net profit for the first quarter of 1941 amounted to $3,546,822. This compares with net profit reported for the first quarter of 1940 amounting to $2,960,573 on the basis of tax liabilities under the laws in force at that time."

Consolidated profit and loss statement follows:—

STATEMENT OF CONSOLIDATED PROFIT AND LOSS

	Three Months Ended March 31, 1941	Three Months Ended March 31, 1940
Sales and Other Income:		
Gross sales, less returns, allowances and discounts	$43,410,420.58	$33,304,050.51
Other income—net	662,131.47	358,040.46
	$44,072,552.05	$33,662,090.97
Cost and Expenses:		
Cost of sales:		
Pulpwood, labor, materials, etc.	$23,001,058.75	$19,381,503.14
Maintenance and repairs	2,379,136.73	1,969,897.88
Taxes (other than income taxes)	832,568.21	751,625.10
Outward freight and delivery expenses	5,598,321.35	4,011,961.35
Selling, general and administrative expenses	1,743,855.57	1,520,207.13
Provision for doubtful accounts	162,928.70	152,754.44
	33,717,869.31	27,787,949.04
	$10,354,682.74	$5,874,141.93
Deductions:		
Interest on funded debt	$714,217.22	$781,414.88
Interest on other debt	2,318.32	1,045.68
Amortization of debt discount and expense	83,731.89	87,938.31
Depreciation and obsolescence	2,708,315.50	1,186,743.28
Depletion	209,220.36	196,205.87
Provision for income and excess profit taxes under existing laws:		
United States:		
Federal normal	1,232,576.00	559,501.66
Federal excess profits	918,088.00	—
State	158,799.00	77,430.00
Canadian and other foreign	266,077.76	6,713.08
Dividends paid on stock of subsidiary	8,498.75	—
Dividends accrued but not being currently paid on preferred stocks of subsidiaries	6,017.25	16,575.75
	6,307,860.05	2,913,568.51
Net Profit before reserve for possible additional taxes	$4,046,822.69	$2,960,573.42
Reserve for possible additional income and excess profits taxes	500,000.00	—
Net Profit	$3,546,822.69	$2,960,573.42

At March 31, 1941, the undeclared cumulative dividends on the outstanding Cumulative Convertible 5% Preferred Stock amounted to $10.00 per share or a total of $9,259,350.00.

The above statements are subject to audit and final adjustment at December 31st (end of the fiscal year).

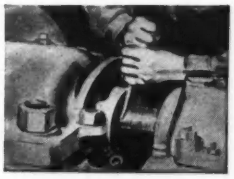
Bryant Papers

A portfolio of Bryant papers has been issued to the trade by the Bryant Paper Company, Kalamazoo, Mich. The portfolio consists of an attractive and convenient box containing printed specimens representing the Bryant line of quality printing papers. Papers include Cellugloss, C-1-S and C-2-S, No. 1 Printing Enamel, Pliable Enamel, Milham Enamel, Brycoat Enamel, De Soto Super, Sunbeam English Finish and Bryantique Eggshell.

If you think all Packings are alike

Test CUTNO*

and note the difference



Yes, we agree that all packings *look* more or less alike from the outside. So how can you tell a superior packing from an ordinary one? The best way is by actual test—that's the way many other engineers have proved to their own satisfaction that CUTNO *is* superior for all kraft liquors, caustic soda, and other alkalis, regardless of the pH.

FREE Working Sample

Don't take our word for it. Test a working sample under your own operating conditions, without charge or obligation. More than 90% of the engineers who have made this test have become permanent users. To find out why, fill in and return the coupon, and free working sample will be sent you.

Greene, Tweed & Co., Bronx Blvd. at 238 St., New York City

***CUTNO PACKING for alkalis**

* Reg. U.S. Pat. Off.

Made by the manufacturers of PALMETTO®

Send the Coupon

GREENE, TWEED & CO., Bronx Blvd. at 238th St., New York City

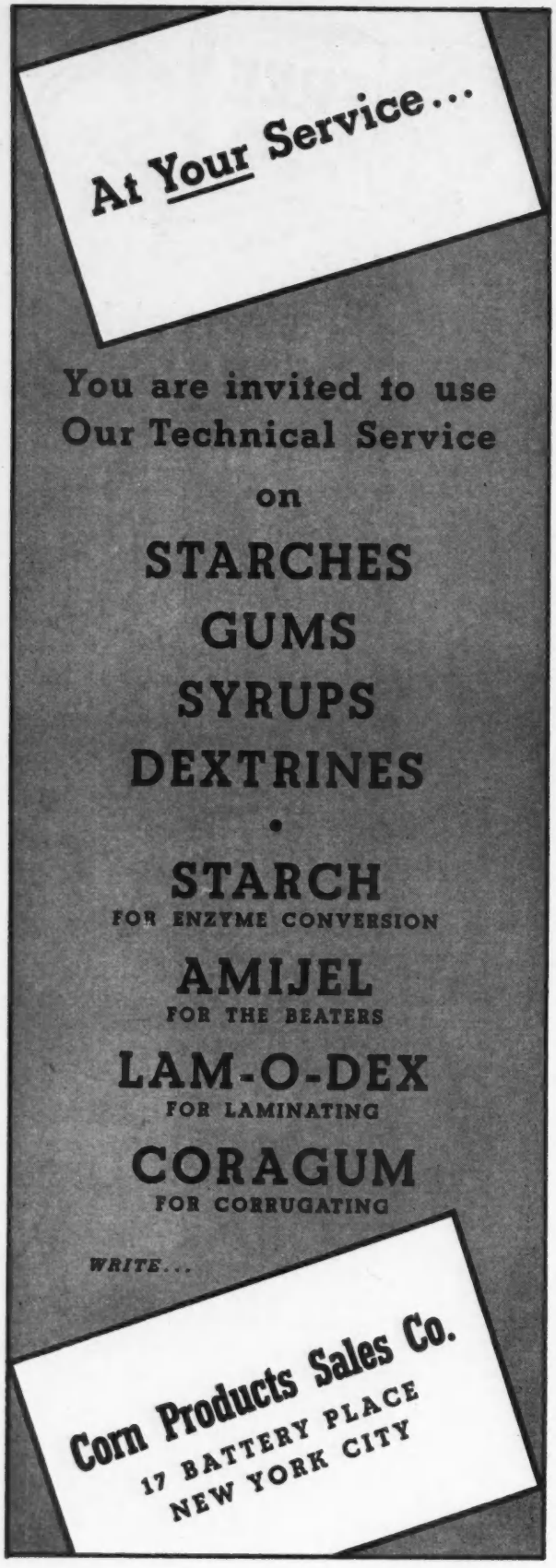
Send free working sample of packing .....size, for

..... service.

Name .....

Company .....

Address .....



Southland Mill Makes Record

For 49 hours recently, newsprint sped through a G-E-driven paper machine at the Southland Paper Mills, Inc., Lufkin, Texas, without a wet end break or a snap-off at the calender stack, establishing an excellent record in the newsprint industry for a continuous run. This speaks well for the operator, management, and the smoothness and accuracy of the General Electric drive.

The Southland mill, the first of its kind in the world to utilize Southern pine 100 per cent in the manufacture of newsprint, offered a real challenge to engineering ingenuity. The combination of grinder and paper machine load was subject to load variations as large as 3000 kw. As the independent units of the paper machine are linked by only the weak web of paper in process, it was obvious that any minute variation in system frequency or direct-current generator voltage would affect section speeds differently, and so would cause breaks in the paper.

Careful engineering and co-ordination solved this problem. General Electric turbines in this plant were equipped with three-arm governors, capable of holding speed within extremely narrow limits under the worst swings of load. To prevent even this small variation from interferring with the successful operation of the machine, voltage and speed regulators were carefully co-ordinated in the drive.

Remarkable Career Comes To Close

New York, May 20, 1941

Editor, PAPER TRADE JOURNAL:

With the passing of Byron B. Taggart of Watertown, N. Y., president of the Taggart Corporation, and interested in many other industrial enterprises, a prominent figure in the papermaking world of the last forty years, a remarkable character and career came to a close.

B. B. Taggart befriended me thirty-five years ago and much of what I have been able to accomplish must be attributed to his faith, confidence and friendship. Byron B. Taggart was one of the most remarkable characters I have met and as late as last summer I was his guest in Watertown.

I feel the need at this time to pay tribute and express my sorrow on the passing of this very remarkable American of the old school.

HANS LAGERLOEF, President
Lagerloef Trading Company

Unions Against Sunday Work

[FROM OUR REGULAR CORRESPONDENT]

OGDENSBURG, N. Y., May 26, 1941—Labor troubles are being experienced at the Algonquin Paper Company where the unions insist that Sunday work be abolished and the company claiming such a move would make operation of the plant unprofitable. The company had previously agreed to an hourly raise of five cents per hour for all workers and continuation of the week's vacation with pay started a year ago. The increase in wages would amount to about $40,000 annually. Representatives from the International Brotherhood of Papermakers and the International Brotherhood of Pulp, Sulphite and Paper Mill Workers were here for conferences with the management during the past few days but negotiations were abandoned over the problem of working Sundays.

Paper Men Hold Outing

BOSTON, Mass., May 26, 1941—Approximately 60 New England paper merchants and their guests were present at the Annual Spring Outing of the New England Paper Merchants Association at the Oakley Country Club, Watertown, Mass., last Monday. Festivities began with luncheon at 12:30. There was a large numger for golf and the dinner, after which the following prizes were awarded:

Members—Low gross, W. B. Stetson, Jr., Storrs & Bement Company, one dozen golf balls; kickers handicap, Harold Simmons, Industrial Paper & Cordage Company, traveling bag; blind bogey, J. R. Whitney, Whitney-Anderson Paper Company, Inc., time secretary.

Guests and members—Kickers handicap, A. H. Chamberlain, executive secretary, National Paper Trade Association of the United States, pen and pencil set; whisker, M. H. Broom, Providence Paper Company, six golf balls; longest drive on fairway from 16th tee in, John Blackman, D. F. Munroe Company, six golf balls.

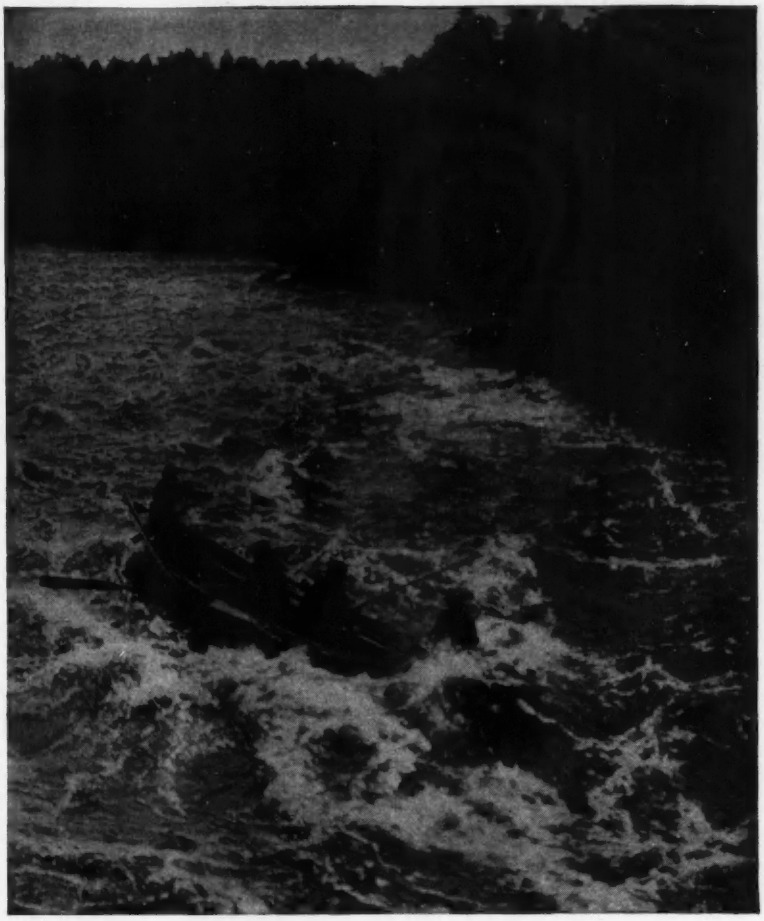
Non-golfers, members and guests—Putting contest, J. Mathews, Century Paper Co., toilet set.

Special prize for the one who got the most out of the course—Hubert L. Carter, president, Carter Rice & Co., Corp., time secretary.

After the dinner, Professor George Owen, of Massachusetts Institute of Technology, gave an illustrated talk on naval matters, of particular interest at this time, in view of the Defense Program. W. C. Jack Wood, also of M. I. T., showed colored moving pictures of the development of small boat racing in the Charles River Basin.

Reach Wage Agreements

CARTHAGE, N. Y., May 26, 1941—Announcement is made here of the reaching of a new agreement between the National Paper Products Company and the International Brotherhood of Papermakers under which all employes will receive a wage increase. The male employees will receive an increase of five cents per hour while the women will obtain a raise of three cents an hour. A new agreement is announced by officials of the St. Regis Paper Company and Taggart Corporation June 1.



Rapid Water Expulsion in papermaking is promoted by adequate porosity in papermakers' felts. The more water expelled at the presses, the less it will cost to dry your paper.

A Draper Felt designed for your particular product will help in this respect to lower your drying cost and bring the paper to the dryers in a uniform state of moisture content.

Draper Felts Favor Efficiency

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856 CANTON, MASS.

OUR REPRESENTATIVES *to serve you*

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O. J. LELOFF, Vancouver, Wash.

PAPER TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger
EDITOR

Vol. 112 May 29, 1941 No. 22

COMING EVENTS IN PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, Twenty-second Annual Convention, Poland Spring House, Poland Spring, Me., June 17-19.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Fall Meeting, Ann Arbor, Mich., September 16-19.

REALISM IN TAXES

It is perhaps too much to expect that a completely satisfactory taxation plan will ever be formulated. No one likes to pay taxes and no Congress has ever been very successful in writing a good tax bill. During the terms of President Roosevelt, the taxation schemes adopted have contained provisions and ambiguities deterrent to business and to the public interest. The original excess profits tax was one such example. It is a very difficult undertaking to frame a thoroughly good and equitable tax bill. Two considerations are of great importance; the required revenue and the minimum deterrent effect upon normal business expansion and activity. Haste in preparing the bill and too much dependence upon revenue and too little consideration for the practical reaction of laws on business, appear to be the chief reasons why expediency in tax matters has so frequently fell short of the results expected and desired. Realism in taxes is wanted, declares the *Washington Review,* published by the Chamber of Commerce of the United States.

In declaring that a more realistic revenue plan is needed, the May 19 issue of the *Review* states that, "The need of a realistic tax program will minimize in some degree the uncertainties created by confused proposals for revenue legislation is daily becoming more urgent. In greater measure than ever before taxes must be taken into account in estimating business costs and adjustments must be made accordingly so far as they can be anticipated. There are certain fundamental questions. Among them: How much money will be required for national defense preparations in the coming fiscal year and, assuming no shooting conflict, in the following year? How much will be required to carry on necessary ordinary government operations? How much of this money should be raised by taxes and how much by borrowing? How much can ordinary government expenditures be reduced?"

Continuing, the article says that, "A formula or pattern such as this is highly important, if Congress is to frame a reasonable revenue measure taking into account ordinary as well as emergency needs and, at the same time, keeping in mind conditions that will arise when the emergency has passed. Some pertinent facts are obvious. Savings can be effected in the expenditures of ordinary government operations. The national income will be larger and existing taxes will yield more revenue; how much more will depend upon taxes designed to recapture a portion of the government outlays for defense. The increase will go mainly to the income brackets which pay the lower tax rates. Only by a careful balance in taxes can adequate revenues be obtained with a fair distribution of the burden. In sharper outline a realistic program is needed as a basis for further revenue legislation."

A clear presentment of basic taxation was contained in an article by Godfrey N. Nelson, in the May 4 issue of *The New York Times.* "At the beginning of the 19th century," Mr. Nelson said, "when the heavy taxation of real and personal property became extremely unpopular in Central Europe, there arose the custom of assessing property on the basis of its yield or product rather than on the basis of the selling value of the property. Next came the tax on wages and on the product of capital, called the income tax. Our own income taxes, except the Civil War income tax, which was held by the United States Supreme Court as inapplicable to capital gains, have been a sort of combination of income and property taxes. This combination had its origin in the so-called corporation income tax of 1909, which in fact was an excise tax. The Supreme Court extended its ruling under the 1909 act to the income tax, holding that realized accretions of property are taxable gains."

Continuing, Mr. Nelson goes on to say that, "Whether that form of taxation has been a profitable source of government revenue, considering its comparatively greater cost of administration and the broad upward and downward movements of property values controlling gains and losses, may be seriously questioned. Moreover, the varying elements entering into the calculation of gains and losses have contributed in a very large way to income tax litigation. One of the troublesome elements has been the basis of costs of property and its determination in a variety of situations. Corporate reorganizations present situations in which the basis of property disposed of may be either the cost to the corporation whose assets are acquired or the cost to the new corporation, the result depending upon whether or not the reorganization is tax exempt under the law. Where one corporation acquired all the assets of

another through the medium of a bondholders' committee in a reorganization, of which both corporations were parties, it was held by the Circuit Court of Appeals for the Fifth Circuit, under Sections 112 and 113 of the 1934 Revenue Act, that the basis for determining losses on certain worthless assets is the cost of the assets to the old corporation (Commissioner of Internal Revenue, petitioner v. Southwest Consolidated Corporation, respondent, decided April 19, 1941, affirming the Board of Tax Appeals)."

In commenting on this case, Mr. Nelson said that, "The principle involved is not only controlling for the purpose of charging off worthless assets, as in the instant case, but it is also employed for determining gain or loss on a sale of property acquired in the reorganization, for charging depreciation and it is related to the prescribed method for determining the amount of invested capital for excess profit tax purposes."

The problem before Congress now is to find ways and means of raising $3,500,000,000 of new tax revenue without imposing too heavy a burden on taxpayers. Four plans have been presented; (1) Treasury Secretary Morgenthau wants to keep unchanged the present grouping of income taxpayers, those with income of $2,000, if married, and $800 if single. By imposing a tax beginning at 16.5%, instead of the present 4.4%, it is expected that this tax, graded higher as income increased, will raise $1,500,000,000 annually. In addition there would be a higher rate of normal tax on corporations, to yield about $500,000,000, and additional excess profits tax to bring in $400,000,000.

To this would be added higher estate taxes and new taxes on gasoline, automobiles and other goods and services.

The suggestion of Leon Henderson, would make use of taxation to help control prices, by imposing very heavy taxes on refrigerators and automobiles that compete with defense goods. By imposing a tax, starting at 20% on new and used automobiles, about $900,000,000 additional revenue would be raised. On the other hand, Marriner Eccles has recommended lowering exemptions from individual income tax so that the Government will tax the low income groups which represents the largest volume of income. But, unlike Secretary Morgenthau, Mr. Eccles would modify the 16.5% tax, which he thinks is too heavy. Congressional tax experts take the view that a 16.5% starting tax on taxpayers in the lower brackets is too heavy and favor an imposition starting at 11.5%, which would raise about $1,100,000,000 from this source. Some Congressmen also favor cuts in the exemption from excess profits taxes, and would increase the number and the rates of sales taxes, although the recent proposal to tax coffee, tea, sugar, etc. is not generally viewed as desirable.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks, 1941		Corresponding Weeks, 1940	
April 12	95.4	April 13	81.8
April 19	94.5	April 20	86.5
April 26	98.3	April 27	89.4
May 3	100.1	May 4	89.3
May 10	100.9	May 11	88.6
May 17 (Prelim.)	*98.8*	May 18	91.7
(7-day operations prevalent)			

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1940	89.1	84.7	82.3	84.3	90.0	92.1	85.3
1941	85.1	89.4	92.3	*96.7*	...	...	...

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1940	85.1	81.5	85.5	84.9	80.9	85.6
1941	...	...	...	...	...	...

COMPARATIVE YEARLY SUMMARIES

	1935	1936	1937	1938	1939	1940	1941
Year to Date..	68.4	78.0	89.6	67.6	80.2	86.0	*91.6*
Year Average..	69.9	80.4	79.8	71.5	83.4	85.6	...

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS †

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1936	62	67	67	70	69	70	69	75	78	82	80	74	72
1937	80	86	86	88	85	77	66	74	69	65	55	45	73
1938	54	60	61	57	58	56	57	66	66	70	65	59	61
1939	60	67	71	69	64	67	63	72	74	84	81	71	70
1940	71	70	69	70	76	79	72	74	72	79	77	71	73
1941	75	81	82	*83*	..	..	..	..	..	..	..	..	..

Week ending Apr. 12, 1941—85
Week ending Apr. 19, 1941—78
Week ending Apr. 26, 1941—84
Week ending May 3, 1941—83
Week ending May 10, 1941—84
Week ending May 17, 1941—*84*

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

May Buy Lake Sulphite Co.

TORONTO, Ont., May 26, 1941—Negotiations conducted at Montreal yesterday in connection with the Lake Sulphite Pulp Company, Ltd., involved a proposal whereby the assets of the company (in receivership since February, 1938) would be sold to a new company controlled by a group of Michigan paper mills. Approximately $4,000,000 of new money would be required to complete the plant. On this basis, capital of the new company would amount to about $8,000,000. Management of the new undertaking and technical direction would be under the guidance of United States mills, with Canadians, however, offered equal representation on the board. Under the proposed deal, Canadian claimants, except expenses of receivers, would be paid off entirely in junior securities, which would include 49 per cent of the new common stock to be issued. Plant would be in operation in 1942, with an assured market over a long term, it is stated.

To Close Saturday

ST. LOUIS, Mo., May 26, 1941—The Baker Paper Company, Inc., Beacon Paper Company, Butler Paper Company, Shaughnessy-Kniep-Hawe Paper Company and Tobey Fine Papers, Inc. have issued a notice that they will close all day Saturday beginning May 31 and continuing this arrangement during June, July and August. These concerns have sent out a notice stating: "In order that our service to you may not be impaired, it is requested that you place orders for your paper requirements in time for Friday deliveries."

"0000-0000"

...WAILED THE GHOST FROM PAGE 52 TO THE BOY ON PAGE 51

"OOOO-OOOO yerself!" cried the boy. "G'wan back to yer graveyard! Yer killin' my business!"

"Forsoo-oo-th, I'd much prefer the quiet of my tombstones," answered the ghost. "But..."

"Then hop the next uptown express. Only ten minutes to the cemetery."

"But I can't hop *anywhere*. I'm stuck," moaned the ghost. "My keeper lost his Krebs Pigments."

"Whaddyamean, Spook?"

"I'm *show-through* from the next page. Krebs Pigments take *show-through* out of the thinniest paper."

"So you need Krebs Pigments, eh? Who's your keeper, ghost?"

"The paper manufacturer, of course. Krebs Pigments keep printing on one side of the paper. And the print stands out sharply and clearly because the paper is as white as..."

"... as a ghost?"

"Yes. Thank you. Besides, the Krebs people answer all kinds of technical pigment questions... say, it wouldn't be worth your while to write them about me, would it?"

"Worth while? And me losing all my customers when Krebs Pigments can fix *show-through* so easy? Worth while? You bet it's worth while! I'm writin' NOW!"

KREBS PIGMENT & COLOR CORP.

1007 Orange Street...Wilmington, Delaware

Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Use of Sveen Glue*

By P. M. Loddengaard[1] and Richard Tutt Jr.[2]

Abstract

Sveen glue solution rapidly flocculates filler and fibers, increases their retention, and gives added freeness to the stock on the wire on closed as well as open systems, opening the way for savings through improved operating advantages as well as savings in filler, color, fiber and sizing. The suggested possible operating savings probably overshadow and are more important to the mills than filler savings which heretofore have been the only basis many mills have considered in the possible use of the Sveen method.

Since the introduction of the Sveen method of fine fiber and filler retention to this country in 1936 *(1)* requests have come in for information as to whether Sveen will work advantageously on a closed system. The thought behind these requests is usually that of filler savings and where systems are pretty well closed-up and good re-use is made of white water some of these mills have felt heretofore the filler loss, especially in the case of low-priced clays, was so small the savings to be effected were about even with the costs to operate it. Naturally we have learned many things about Sveen and its effect on stock and water on the paper machine in our four years' experience with it that were not apparent at the time of its introduction.

As filler saving is but one of the angles to the method it is felt a further description of what happens when Sveen glue is used accompanied by some figures taken during trial runs on closed systems will throw additional light on the operating advantages gained from its use which are more important to the mills than just savings from low-priced fillers.

Method and Purpose

In U. S. patent 1,622,474 the method is described as a "process of producing paper comprising the steps of incorporating into dilute paper pulp containing a mordant and being in the condition ready to be passed on to the wire cloth of the paper machine, a small proportion of *an auxiliary substance* of such a character as to become contracted or coagulated by interaction with mordants." The claim as shown here permits the use of "an auxiliary" substance of which there are many. A number of them may be used under this patent to improve retention but the reason the glue solution is suggested is because of its simple requirements. This patent was granted not essentially with respect to the particular materials added but with respect to the *place* or *stage* at which they are added.

A dilute solution of a good hide-stock glue is made up and chemically changed to give it the necessary characteristics to flocculate fibers and fillers rapidly *(2)* on the wire or in the cylinder vat. This change in characteristic is from a hydrophilic to a hydrophobic state *(1)* and takes place during a ripening period before using. This ripened solution is fed to the stock at a prescribed rate at the paper machine itself. It cannot be introduced at the beaters or machine chest successfully.

You will note a "good hide glue" is specified. Every standard grade of animal glue both hide and bone stock in regular commercial use has been tried. These trial batches have been used in commercial runs on paper machines and retention results checked. It takes up to 40% more glue per ton of paper, using the cheaper grades, to get comparable results with the established standard. Even one grade lower shows a difference. On the other hand do not assume from this that the higher you go in grade the greater will be the retention because the slight increase in retention is so small that a curve drawn to compare values flattens out above the particular grade set as the standard.

To ascertain what the method will do if the system is closed, there should be a comparative run on the same sheet of paper with and without it. When everything is set up for the trial, immediately before any Sveen glue solution is turned on, water samples are taken from the headbox, trays, suction boxes, effluent from save-all, and frequently of water to the save-all. On cylinder machines water samples are taken from headboxes, vat overflow, and save-all effluent. Simultaneously with the taking of these samples a tear-out of the paper on the reel is secured to tie-in with them. A record is kept of beater furnishes including broke and/or slush stock. If any re-used water, carrying filler, from a service tank is being used on the machine or to drop beaters, samples of that are taken. Where such water, carrying filler, has been used off and on without any particular attention being given to its filler content, wide variations may occur in ash tests from time to time.

After the first set of samples have been taken the Sveen glue solution is turned on. Usually the first

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 17-20, 1940.

[1] Member TAPPI, Bulkley, Dunton Pulp Co., New York, N. Y.
[2] Member TAPPI, Peter Cooper Corps., Gowanda, N. Y.

observation, particularly on heavily filled sheets, is an immediate slowing up of the sheet accompanied by a jump in weight and ash, indicating that the glue has taken up the rich solids in the circulating back waters. This is only temporary. The machine tender shuts off some stock and adjusts his weight, the system soon becomes leaner, but the ash still remains above normal. The next observation after this first surge is over, is that the sheet is freer on the wire, the drainage is more rapid. Frequently when trays are shallow they overflow with the excess water leaving the sheet, the sheet seems to dry easier and there is a drop in back pressure.

We cannot attempt to explain technically why this increase in freeness and drainage takes place. Recent figures were taken on a 40-pound sheet, using the headbox sample. It was found the freeness before the glue averaged 370. With no change other than that of the addition of glue, this freeness increased to an average of 460 — remaining at this figure as long as glue was on the machine, dropping back to the former figure when the glue was shut off. This particular mill was running a book paper. The broke and old paper stock were mixed with the new pulp at the machine, both having been prepared separately. The slow broke and old paper stock necessitated the maintenance of a freeness of the new pulp at the jordans of about 450 in order to counteract their excessive slowness. As soon as the phenomena of increased headbox freeness was observed, it was believed that the new pulp could be slowed up somewhat at the jordans thereby obtaining much better sheet formation, without any sacrifice in operating speed.

An observation of the settled-out solids in samples of tray or suction box water with and without the glue may give you a clue to it. The bulkiness to these solids with the glue on the machine is much greater. When filtering these samples for solids in the laboratory you will observe how much more rapidly those with Sveen glue drain. The next step is to curtail the furnish of filler until the ash in sheet resumes its normal level. When this is settled down, further water samples may be taken as frequently as desired from exactly the same points they were taken previously, together with tear-outs at the reel and comparisons of each set made.

An example among common observations was on a 35- or 36-pound sheet, carrying 19 to 20% ash, solids in the headbox before starting the glue were close to 85 or 86 pounds per 1,000 gallons, of which 45% was filler. In the tray water, solids ran close to 60 pounds per 1,000 gallons, suction-box water 20 to 22 pounds. The machine had a good mechanical save-all, the effluent consistently averaged 3½ pounds per 1,000 gallons. After putting glue on the machine, with weight and ash adjusted to normal a check of water samples over a long period showed average changes: headbox solids dropped from 85 or 86 pounds to 64 pounds per 1,000 gallons. That is 25%. The percentage of filler in those solids dropped from 45 down to 31%. In other words, without glue on the machine there were approximately 40 pounds of filler per 1,000 gallons and when glue was being employed only about 19 pounds per 1,000 gallons, a drop of 50%.

The tray water solids dropped from 56 to 29 pounds, a 46% decrease; suction box solids dropped from 22 pounds to 4½ pounds, close to 80% decrease. The save-all effluent solids dropped from 3½ pounds to 1¼ pounds, a decrease of 60%, which increased the efficiency of that save-all. We have yet to see a single instance on any trial with any type mechanical save-all where the drop in solids in the effluent wasn't at least 50%. From the foregoing figures you have the same weight sheet and same ash, made . . . . with 25% less solids in headbox (50% less filler).

Advantages

Whatever tendency there may have been toward two-sidedness in the finished sheet has been changed for the better, formation improved, more fines retained, and filler and color more evenly distributed through the sheet. Invariably the sizing is better. The duplexing or two-sidedness on colored sheets is materially lessened. Reductions in size and color furnish, as well as filler furnish are secured.

On the trial run just described it had been necessary before running with glue to have usually a couple of washups every tour. With glue on the machine these washups were reduced to one every tour. The original start-up of Sveen glue was made breaking into production the middle of the week, more or less slime and dirt had been building up in the system, naturally the action of the glue broke this loose, slugs began coming over, break after break on the machine with the broke piling up, for about two hours. Then it started clearing up, the system had been pretty well cleaned out and the machine settled down running for hours without a break, much better than normal. For 14 days immediately preceding the trial this machine averaged 16½ tons per day, the next 13 days with glue, 19 tons per day all on the same sheet. In another mill making book papers which has used glue over three years, their white water system is closed. Since adopting the use of Sveen glue, suction box water is used on all showers, the small amount of clay present in this water seems to have, so they feel, just enough abrasive action that spray nozzles keep clear, no fouling; they feel that the buildup in temperature of the reused water is just about high enough to kill some of the slime-forming bacteria and their problem of keeping down slime is somewhat easier than before.

If a mill uses fresh water on showers it cools down the rest of the water particularly in winter. In a mill using 3,000,000 gallons of water per day, where coal has a value of 12,500 B.t.u., approximately 50 tons of coal are needed to raise the temperature of that quantity of water 50 deg. F., and for every degree rise it takes 1 ton of coal per day.

In a small mill the temperature of the fresh water in winter was 41 deg. F., and about 300 gallons per minute were discharged to the river without much re-use at a temperature of 92 deg. F., a raise in temperature of 51 deg. About 7 tons of coal per day would be required to secure it. Additional re-use of this water should contribute to reducing coal consumption. The following figures can be used for estimates:

2000 g.p.m.	1 ton coal per deg. F.
1000 g.p.m.	½ ton coal per deg. F.
500 g.p.m.	¼ ton coal per deg. F.
250 g.p.m.	⅛ ton coal per deg. F.

The increased retention of filler secured by using Sveen has reduced materially the rate of clogging wet press felts, hence less frequent necessity of washing. Moisture-free solids at the first press averaged 31%, at the second press 37%, from the wire 15%, without the glue. Another test showed first press slightly over 30%, and second 37%. On the

same machine when the glue was used the first press showed 35% and the second 39% with the wire showing 20%. A second test showed slightly under 36% at the first press and 41% at the second with the moisture-free solids from the wire 19.5%. This shows an increase in solids at the wire of a little under 29%. The final figure at the last press is not quite so impressive, but it should give you an indication of the possibility for better formation and more effective use of water. With this easier drying two possibilities present themselves, a reduction in steam demand at the driers and an increase in machine speed. On some machines increases of 15, 20, and more feet per minute have been made. On a trial run on hanging stock the moisture in the sheet normally ran 6 to 6.5%. With glue on, it kept dropping until it reached 4%, steam had to be reduced.

In sizing tests by the ink flotation method before Sveen glue was used where the reading would be 10 to 12 minutes, with Sveen glue it would increase to 18 to 20 minutes. On the hanging sheet mentioned it rose from 5 minutes to 11 minutes. On an unfilled sheet, hard-sized, it rose from 18 to 35 minutes. Maybe this is an extreme case, but one of the mills now using Sveen glue states that on one of its highly filled sheets they always had some difficulty maintaining the size test but with the adoption of this method they secured desired results with 50% less rosin than formerly used on this particular sheet.

Sveen works regardless of machine pH. It has been run successfully on a machine where the pH was as low as 3.7 and on up the range to 7.8 with carbonate fillers. Addition of Sveen glue solution does not change apparent pH of paper machine tray water.

Literature Cited

(1) P. M. Loddengaard, *Tech. Assoc. Papers* 20:291-296 (June, 1937).
(2) August Erspamer, *Tech. Assoc. Papers* 23:132-137 (June, 1940).

Tools of the Chemist

The Reinhold Publishing Company has just published an interesting book by Ernest Child of Einer and Amend, Inc., entitled The Tools of the Chemist, (220 pages) Their Ancestry and American Evolution. This book concerns the events and those whose work played a significant part in the creation and development of chemical laboratories and apparatus in America.

Brief sketches are given of men who founded and developed the laboratory arts. Historical records of the development of the analytical balance, chemical glassware, porcelain ware, fused silverware, metal laboratoryware, platinum, rubberware, optical apparatus and described together with an account of the histories of the laboratory apparatus distributing houses.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd street, New York, N. Y. at $3.50 per copy.

Lungchang Paper Mill Starts

WASHINGTON, D. C., May 28, 1941—The Chinese press reports that the Lungchang Paper Mill, formerly located at Shanghai but transferred to a point near Chungking, West China, is now under production, putting out approximately 6 tons of newsprint paper daily.

New TAPPI Members

The executive committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership:

Richard R. Chase, student, University of Maine, Orono, Maine.

John W. Crosson, Mead Sales Corporation, New York, N. Y., a 1934 graduate of the University of Maine and formerly with Case, Lockwood, Brainard, Hartford, Conn.

Eugene F. Donnelly, student, New York State College of Forestry, Syracuse, N. Y.

William M. Grohmann, Franklin Research Company, Philadelphia, Pa., and formerly with Tex-Cell Inc., Gloucester, N. J.

J. A. Hanna, control superintendent, Bathurst Power and Paper Company, Ltd., Bathurst, N. B., a 1922 graduate of Queens University and formerly with the Celotex Company, Marrerro, La.

Roy Homans, chemist, Ohio Wax Paper Company, Columbus, Ohio, a 1936 graduate of Ohio Wesleyan College and formerly with the Mead Corporation, Chillicothe, Ohio.

Albert J. Hoselton, acting chief chemist, Brownville Board Company, Brownville, N. Y.

Hannes Jansson, assistant mill manager, Sunila Company, Sunila, Finland, a 1934 graduate of the Technical University of Finland.

Douglas Jones, secretary-engineer, technical section, Canadian Pulp and Paper Association, Montreal, Que., a 1925 graduate of McGill University and formerly with the Ontario Paper Company, Ltd., Thorold, Ont.

Lloyd L. Klinger, chemist, Ward Paper Company, Merrill, Wis.

A. W. Koon, staff chemist, Columbian Rope Company, Auburn, N. Y., a 1930 graduate of New York State College of Forestry and formerly with the Bogalusa Paper Company, Bogalusa, La.

Gunnar Kulvik, assistant mill manager, Enso-Gutzeit Corporation, Helsinki, Finland, a 1934 graduate of the Technical University of Finland and formerly with the Tornator Corporation, Kaukopaa, Finland.

G. S. Mabrey, chief chemist, Southern Kraft Corporation, Mobile, Ala., has been transferred from the Associate to the Active grade.

John M. McEwen, student, Institute of Paper Chemistry, Appleton, Wis., a 1939 graduate of Ohio State University.

John B. Shields, control chemist, Benj. C. Betner Company, Devon, Pa., and formerly with the White Bros. Smelting Co., Philadelphia, Pa.

George D. Smithwick, chemical engineer, Container Corporation of America, Chicago, Ill., a 1940 graduate of the University of Wisconsin.

Solomon Steinberg, chemist, The New York Times, N. Y., a 1936 graduate of City College.

Sven J. Storgards, chief chemist, A. B. Kemi O. Y., Karihaara, Kemi, Finland, a 1936 graduate of Tekniska Hogskolani of Finland.

Rex Vincent, technical sales and service, Bulkley, Dunton Pulp Company, New York, N. Y., has been transferred from the Associate to the Active grade.

Orin A. Weiss, consulting engineer, New York, N. Y., formerly with the National Lead Company, Sayreville, N. J., and Oliver United Filters, Inc., New York, N. Y.

Pulp Bleaching*

A Literature Review from December, 1939 through November, 1940

By John L. Parsons[1] and John C. Tongren[2]

Abstract

This literature survey of pulp bleaching, made at the request of the Pulp Purification Committee of the Technical Association of the Pulp and Paper Industry, covers the period December, 1939 through November, 1940. A survey of pulp bleaching for the previous year was made by Jackson and Parsons (22).

During the past year not only has the work on the nature of the coloring material in unbleached pulp been reported, but there have been several important papers on bleach plant design and materials of construction. Consideration has been given to the more effective use of multi-stage bleaching. For instance, the need for more versatile equipment to process pulps for widely separated use requirements has been met in the Kamyr bleaching apparatus.

According to Moore (*38*), a modified Thorne bleaching system in a southern sulphate mill operates on a batch system for the final hypochlorite stage, thus permitting the manufacture of a white and a semibleached pulp in close enough time intervals to run simultaneously on a cylinder paper machine. The plant bleaches in either three or four stages as required.

In a review of the developments in bleachmaking and in pulp bleaching processes by Wang (*68*) three factors are cited as having contributed to the rapid expansion in the bleached pulp industry: (1) the reduction in cost of bleaching, (2) the improved equipment and materials of construction, and (3) the great expansion in the use of wood cellulose as a raw material for cellulose products, derivatives, etc., with the resulting developments in the chemistry of bleaching. The accumulated knowledge of the nature of the impurities in unbleached pulp and their reaction with bleaching and purifying materials indicated the necessity of a fractionated removal process. Bleaching must be considered as a continuation of the cooking process in the procedure for isolating cellulose. The best regulated cooking processes yield a product which requires careful purification. The following demands must be satisfied by a purification process: (1) removal of all decomposition products from the pulp, (2) thorough penetration of the bleaching agent, (3) equipment permitting exact control of concentration, time, temperature, etc., which influence the degree of purification, (4) rapid removal of decomposition products formed in the process (necessity of a multistage process), and (5) destruction of residual reagents and complete removal of decomposition products at the end of the bleaching process. Wang claims that it is now generally recognized that any purification process should be carried out with a minimum exposure of cellulose to mechanical action because this may lead to side reactions with resulting attack on the cellulose. Our present advance in the knowledge of bleaching is due in great measure to the appreciation of the industry of the value of research during the past twenty years. Development in the fundamental chemistry of cellulose is essential for continued progress. Wang believes that further progress should tend towards simplification, indicating that perhaps the cooking process can be carried further leaving less work to be done in the bleaching operation.

In an investigation relating to the conversion of holocellulose to pulp suitable for high-grade paper, Ritter (*15*) found that after extracting the holocellulose with a hot solution of sodium hydroxide it was necessary to use only 0.17% available chlorine in the form of calcium hypochlorite to bleach the fibers to a good white.

Graff *(12)* reported the number of fibers per gram of a number of bleached pulps, as follows:

Pulp	Number of Fibers per Gram
Softwood bleached sulphite	9,880,000
Softwood bleached Western sulphite	7,050,000
Softwood bleached alpha	12,850,000
Softwood bleached sulphate	9,225,000

An attempt was made to correlate such factors relating to different pulp fibers as length, width, thickness, gross area, lumen area, perimeter, etc. Cross-sectional areas of pulp fibers are distinctly different and change with the degree of cooking and purification of the individual pulps.

According to Hibbert and his coworkers *(54)*, the difficulties in bleaching kraft pulp are due to the presence of lignin and its degradation products formed during the cooking and bleaching processes, rather than to colored materials, such as phlobatannins. The chlorination of residual kraft—or alkali—lignin yields products of a complex character. The sulphur present in the residual lignin of kraft pulp may tend to form insoluble products in the chlorine solutions. It is probable that the acid soluble lignins are responsible for the lack of permanency of the bleached pulp color. These soluble lignins can be removed only by a thorough washing of the pulp. In the opinion of the authors, the major difficulties in bleaching kraft pulp are still to be found in the question of the structure and properties of residual lignin, although colored materials absorbed from the black liquor add to the problem.

Hanson *(17)* reported in his study on the action of sulphide in the sulphate pulping process that the bleach consumption at a given lignin content tended to increase with the sulphur content. The effect was of secondary importance, however.

According to Butterworth *(7)*, cellulose degradation varies directly with the concentration of chlorine, although at a given concentration the fiber damage is independent of the total amount of chlorine present. His discussion refers particularly to the bleaching of flax and stresses the advantage of multistage bleach-

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 17-20, 1941.

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ing at low chlorine concentration, followed by a peroxide treatment.

There is need for the standardization of a term to be used in describing quantitatively the oxidizing property of bleaching agents. For years the users of chlorine and hypochlorites have not talked the same language. One group has clung to the obsolete method of referring to the strength of hypochlorite solutions in terms of a hypothetical 35% bleaching powder, which material is little used in pulp mills at the present time. Others have described bleaching solutions in terms of their content in "available chlorine," "active chlorine," or "active oxygen." The adoption of one term by the industry to express the oxidizing strength of a bleaching agent would avoid much confusion and would serve to promote a better understanding of bleaching processes. The term *available chlorine* is employed throughout this literature review to describe the oxidizing power of bleaching solutions.

More than one fifth of the chlorine production in the United States is consumed in the bleaching of pulp *(35)*. It is interesting to note that of the country's 500,000 tons of chlorine producing capacity, 63,000 tons are located in 15 plants of the pulp and paper industry.

Discussing the significance of pH in pulp bleaching, Rue *(52)* remarks that the chlorination stage is an excellent means for the removal of lignin with a minimum of damage to the cellulose. Dissolved chlorine (below pH 3) tends to chlorinate organic materials as long as they are capable of being chlorinated. Lignin is reactive towards chlorine, but cellulose and the hemicelluloses do not react. Usually no attempt is made to regulate the pH during chlorination. Hibbert *(36)* and coworkers, however, have recently been granted a patent covering a process in which chlorination is preceded by a hydrochloric acid treatment of the pulp at a pH below 3. In this process chlorine is added to the acidified pulp suspension. The treatment is particularly applicable to the bleaching of sulphate pulp and an economy in chlorine, as well as a superior product, it is claimed.

Another procedure, mentioned by Rue and employed for several years, is to allow the chlorination to proceed at a pH of about 2 for a short time and then, before the chlorine is exhausted, to change quickly the pH to above 8 by adding an alkali. Thus the reaction is transformed from one of chlorination to one of oxidation. This procedure may be of significance in the bleaching of sulphate pulp where high brightness and high strength are desired, but it is not of importance in the processing of sulphite pulp.

In a discussion of continuous bleaching, O'Donoghue *(40)* states that in the case of hard bleaching pulps a large percentage of the chlorine demand can be added as chlorine and then, in five minutes, lime can be added to neutralize the acid and form hypochlorite. For washing the alkaline pulp suspension iron filters would be adequate, thus avoiding the expense of rubber-lined equipment.

Joachim's process *(24)* for producing a purified pulp from bagasse involves chlorination within a restricted range of chlorine application and subsequent steps of alkaline hypochlorite and acid treatments, with washings between treatments.

Hagglund and Heiwinkel *(20)* chlorinated sulphite pulp over a wide range of percentages of the chlorine demand and recovered 50 to 75% of the chlorine as hydrochloric acid. Twenty per cent was found combined with dissolved material and the remainder associated with the lignin in the pulp. An alcohol extraction reduced the chlorine demand approximately 40%, and storage of the moist pulp also lowered the chlorine demand. The only significant effect of complete chlorination on the physical characteristics of the pulp was the reduction in folding endurance. The hydrochloric acid formed was believed to have caused embrittlement of the fiber surfaces.

Attention has been recently directed toward mechanical improvements which will increase the efficiency of the chlorination stage.

Toovey *(64)* has described the Pennsalt bleaching method which depends upon dispersing chlorine in a finely divided condition by means of an ejector in contact with the pulp suspension. The chlorine can be introduced in amounts much greater than the normal solubility of the gas in water, and a rapid chlorination is effected due to the high concentration of the chlorine.

Steinschneider and Knopf *(58)* have secured a patent covering a chlorination process in which the pulp suspension is pumped through a jet at which point chlorine gas is drawn into the suspension.

Pulp mills which prepare chlorine water for pulp chlorination will be interested in the recently published article by Whitney and Vivian *(70)*. The design of gas equipment and data on capacity coefficients of absorption of chlorine in water are discussed. For a chlorine water comprising 3.5 grams per liter, results are presented graphically showing the effect of temperature, inlet gas composition, and liquor rate on the necessary tower height. Data are given (a) for a tower operating as a unit and absorbing 99.5% of the chlorine gas, and (b) for a tower operating in conjunction with a system for the preparation of calcium hypochlorite and absorbing 50% of chlorine gas.

Alkaline Treatment

Application of an alkali at the conclusion of the chlorination stage serves the purpose of neutralizing the acid formed during chlorination of the pulp and removing chlorinated lignin insoluble in water or acid, as has been pointed out by Rue *(52)*. The neutralized or slightly alkaline stock is much less corrosive than a chlorinated stock in its chlorination liquors, and the problem of corrosion resistant materials for handling equipment is simplified.

In contrast to the addition of an alkali to chlorinated pulp chiefly for neutralization purposes are the effects produced when alkalies are applied to develop certain special characteristics in the pulp. Alkaline stages at varying temperatures may be used to make the pulp more satisfactory for the manufacture of special use papers, or wider ranges of treatment may be applied to make the pulp suitable for the varied requirements of dissolving and esterifying processes.

Rozenberger *(51)* has reviewed the theory and practice of refining pulp by cold and hot alkaline treatment, flotation and washing with water.

Intermediate refining of half-bleached sulphite pulp by treatment with 1% potassium hydroxide for 1.5 hours at 105 deg. C. proved beneficial to the chemical tests on the pulp according to Komarov and Lebedev *(29)*. They reported improved viscosity, increased

alpha-cellulose content and reduction in lignin, pentosans, resinous matter, and copper number.

Alkaline solutions of higher concentration exert a more positive refining action, and numerous methods of using such solutions have appeared in the patent literature.

A patent issued to Sheldon and Goff *(56)* covers a process in which delignified sulphite pulp is treated with 15% sodium hydroxide not exceeding 4 hours at 30 deg. C. Impurities are thus removed from the pulp, and the fibers are swollen by the alkali to afford increased reactivity toward esterification.

A pulp refining process patented by Sheldon and others *(57)* comprises chlorination followed by alkaline extraction at 70 deg. C. or higher, so that the resulting pulp may be given its final bleach with less than 0.3% available chlorine in the form of hypochlorite. It was further remarked that even momentary contact of the pulp with caustic in concentration greater than seven per cent tended to set the residual coloring matter on the fibers, rendering it more difficult to remove later.

Discussing the use of alkali in removal of pentosans and resins, Richter *(50)* noted that the alpha-cellulose content can be increased by digesting unbleached or partly bleached wood pulp in weak alkali, such as 0.2% sodium hydroxide at 125 to 200 deg. C. At the higher temperatures, however, the loss in yield is entirely out of proportion with the increase in alpha-cellulose.

It is more satisfactory to use relatively stronger alkaline solutions at lower temperatures with the maximum at 60 deg. C. Under these conditions yield is retained, alpha-cellulose is increased, viscosity does not suffer, and resins are effectively removed. In the case of certain types of raw fibers, especially kraft, this alkaline treatment actually improves papermaking qualities.

Richter made the observation that the removal of resinous matter from alkaline prepared wood pulp is less difficult and the final separation of lignin is more complicated than for pulp cooked by the acid process.

Results obtained by Atuki and Huzimura *(5)* showed that treating beechwood pulp with hot or cold sodium hydroxide, hot or cold acid, certain salt solutions or successively with acid and alkali, lowered the ratio of pentosan to alpha-cellulose in the resulting pulp. This ratio is hardly ever reduced to a value lower than 2%. Considerable loss of material was caused by the caustic treatments which diminish the strength of viscose rayon made from the pulp.

In the purification process patented by Parrett and Woodruff *(42)* unbleached pulp at consistencies from 12 to 30% is treated with sodium hydroxide and trisodium phosphate at temperatures of 45 to 80 deg. C. The washed pulp is then bleached by chlorination and hypochlorite treatments.

Richter *(49)* has described the Kamyr system using a suction filter especially adapted to apply alkaline solution to pulp. The consistency of the pulp is increased to about 14% as it is held under suction on the filter, and through this pulp web is forced a preheated alkaline solution. This alkaline solution displaces original dilution water, and the emerging diluted alkali is returned to a reservoir. From the reservoir the alkaline solution, adjusted to proper concentration, is pumped through the pulp web until the pulp has been thoroughly impregnated and has reached the desired temperature. Mention is made of another special design of filter for the removal of the alkaline liquor without lowering the temperature of the pulp web.

The function of alkaline application to the chlorinated pulp according to O'Donoghue *(40)* is to dissolve the chlorides attached to the fibers and to permit penetration of the fibers that impurities might be released.

Agitation of the pulp at higher consistencies in caustic treatment is undesirable, O'Donoghue believes, both from the viewpoint of power consumption and danger of hydration. For harder pulps such as sulphates, up to 3% sodium hydroxide may be applied, and the reaction temperature may be as high as 93 deg. C.

Hypochlorite Bleaching

In the making of bleach liquor Rue *(52)* recommends stopping the chlorination when the pH of the solution has reached 11.2. At a pH lower than this value the solution tends toward instability which is significantly increased in the presence of compounds of manganese, iron, nickel, or copper. This chlorination end point is most conveniently checked by means of the phenolphthalein test, for if the pink color lasts three or four seconds the pH is at approximately 11.2.

Rue refers to the decrease in pH during hypochlorite bleaching since acids are formed as the bleach proceeds and carbon dioxide results from the oxidation of organic matter. Further lowering of alkalinity occurs as the hypochlorite loses more and more of its available chlorine, and this may result in an attack on both the cellulose and the noncellulosic material, causing noticeable weakening of the pulp. The use of additional alkali in this stage is recommended so that the pH is maintained at about 8. The addition of the alkali should be carried out in steps, for if much alkali were added at the beginning of the hypochlorite stage the bleaching reaction would be strongly retarded.

Khutorshchikov *(26)* noted that a sharp change in the color, viscosity and alpha-cellulose content of a pulp occurs in the early stages of secondary bleaching of half bleached pulp, and after this point the changes are more gradual and uniform.

Available chlorine in the range of 0.5 to 2.5 grams per liter in the bleach bath was found to affect the cuprammonium viscosity of cotton linters in approximately direct proportion according to Pakshver and Poroikova *(41)*.

Komarov and Lebedev *(29)* obtained better results in secondary bleaching of sulphite pulp with calcium hypochlorite than with sodium hypochlorite and chlorine gas.

During the various stages in the bleaching of sulphite and sulphate pulps with chlorine, Lipshits *(33)* found that with the duration of the bleach the viscosity varied inversely, the copper number increased linearly, and the alpha-cellulose content decreased to reach a minimum after 4 hours. The tensile strength was found to increase during the first hour, then decreased to nearly its original value as the bleaching continued.

The total amount of available chlorine in hypochlorite bleaching should be kept low, according to O'Donoghue *(40)*. If two hypochlorite stages are used it is advisable that the final stage have a very small amount of available chlorine and that this is a

low density stage. Some available chlorine should remain in the pulp at the end of the bleach.

The importance of pH control is stressed by Grant *(13)*, who believes the glass electrode is most satisfactory for measuring pH near the end of the hypochlorite stage. Grant refers to the use of calcium carbonate being added in the form of chalk to neutralize acidic by-products formed during the hypochlorite stage.

French patents *(21)* cover the bleaching of cellulose fabric in the absence of actinic rays and at a temperature below 20 deg. C., using a neutral hypochlorite solution with and without added calcium carbonate. Acidulation and washing follow the hypochlorite treatment and the bleach is finished by alkaline peroxide.

Sheldon's patent *(55)* relates to the bleaching of a pretreated pulp with calcium hypochlorite. The pretreatment is carried out to provide a pulp of uniform, lowered bleachability. The actual bleaching process is so controlled as to provide a given cuprammonium viscosity in the final product.

Rawling's *(45)* patent concerns a process of alternate acid and alkaline treatments for bleaching and purification. Chlorine is added to the first stage of hypochlorite and, after a wash, alkaline treatment is applied. The wash after the alkaline stage is followed by another hypochlorite treatment. Sulphuric acid is added to this stage to produce hypochlorous acid; subsequently chlorine is added, and finally sodium hydroxide is introduced so that the bleaching is completed under alkaline conditions.

Murdock *(39)* has received a patent covering a process in which a mechanical refining treatment has been interposed between the alkali wash and the final hypochlorite stage.

A study was conducted by Laughlin and Lips *(31)* on the bleaching of dyed broke to promote its more widespread reuse. Applying a gentle hypochlorite bleach to colored broke representing dyeing with some 85 dyestuffs, it was observed that basic, acid, and some direct dyes were readily removable, while the pigment and a few direct dyes were quite resistant to the bleaching.

Washing and Acid Treatments

Full benefit from the bleaching process is not realized if the impurities reacting with bleaching agents are not thoroughly washed from the pulp after each stage. Considerable attention is being directed toward the washing method. Proper application of the latter will undoubtedly make a noteworthy contribution to improving pulp quality.

When pulp is washed immediately after bleaching, the impurities adsorbed on fiber surfaces are but slightly affected, in the opinion of O'Donoghue *(40)*. The practice he recommends consists in draining the liquor from the fibers, adding dilution water, and then permitting the pulp to soak for a time so that soluble impurities within the fiber may diffuse out. Best results require dilution to about one per cent consistency and agitation to save time during the soaking period. If the washing is done on a vacuum washer it is well to use only fresh water, preferably hot, and in the amount of 15 pounds of water per pound of pulp. Proposed standard specifications for water used in pulp washing are listed by the author. Reference is made to TAPPI Special Report 298 entitled "Survey of Paper Mill Water Requirements."

Advantages of acid treatment are mentioned by O'Donoghue *(40)*. Since the pulp leaving the bleachers usually contains some residual bleach, the application of acid releases the remaining chlorine to effect a final flash bleach of the stock. One to three points increase in brightness may be obtained by this treatment which also tends to render the final color more permanent. Acid treatment may be applied to a washed pulp after the final hypochlorite stage, lowering the pH to 4.5 and permitting a 10- to 15-minute reaction time in the tower before the final water wash.

Rue *(52)* recommends a soaking period in the final washing treatment. He states that the free alkali usually present in the final hypochlorite stage affects the cellulose to increase those forces which attract and hold soluble impurities to the fiber. For this reason the pH should be lowered to 6 or 6.5 in the washing so that the impurities are more readily dissolved. In washing sulphate pulps a double wash at the end of the process is advantageous, and the pulp should be given a soaking period at low consistency in a slightly acid condition.

It was further pointed out by Rue that some impurities act as color indicators, being brighter in the lower pH range, and that a neutral or slightly acid wash water should be used to effect their removal.

The use of sulphurous acid *(40, 52)* reduces ferric compounds to the ferrous state in which condition they are more readily removed. Ferric compounds may be especially harmful if allowed to remain in bleached sulphate pulp.

Sodium hexametaphosphate (Calgon) added to the final wash water, after the action of hypochlorite bleach on a sodium sulphite Douglas fir pulp, seemed to aid in the removal of loosely bound lignin or coloring compounds, which promote color reversion, according to Haffner and Kobe *(14)*.

A variation in the point of usage of the acid treatment is referred to in the patent issued to Sheldon and others *(57)*. In preparing pulps for cellulose derivatives it is remarked that in some cases it may be advisable to allow the hydrochloric acid formed in the chlorination stage to act for 0.5 to 0.75 of an hour after the exhaustion of the chlorine to permit removal of mineral matter.

Other Bleaching Agents

In a number of articles by Vincent and others *(61, 62, 65, 66, 69)* on the use of sodium chlorite in bleaching, the advantages of this new oxidant are described. When sodium chlorite is properly used in the last stage of the bleaching process a high brightness is claimed, particularly with sulphate pulp, without damage to the cellulose. Furthermore, a more permanent pulp color results when compared to hypochlorite bleached pulps. This beneficial effect of sodium chlorite as a pulp bleaching agent may be due to its oxidation potential being below that of hypochlorite. The new bleaching agent can be used on the acid side or employed in a mixture with hypochlorite on the alkaline side.

To Taylor and Vincent *(60)* has been issued a patent relating to a bleaching process in which sodium chlorite, added to a pulp at high consistency, is activated by means of hydrochloric acid gas and the bleaching conducted at an elevated temperature. Hampel *(16)* has a patent similar in nature, but an inert gas is mixed with gaseous hydrochloric acid.

Casciani's *(8)* patented process for the bleaching

of kraft comprises two chlorination stages with alkali added to the second to form hypochlorite, an alkaline extraction stage, which is subsequently combined with hypochlorite, and a final whitening with a small amount of hydrogen peroxide or chlorite.

A Canadian patent issued to Logan *(34)* refers to the use of chlorine water to activate sodium chlorite for the bleaching of cellulosic material such as rayon, etc.

Reversing the usual steps in conventional bleaching, Scheller *(53)* has patented a process involving alkali treatment, chlorination, a hypochlorite stage, and finally a stage using an oxygen-yielding compound such as sodium peroxide. In the final stage use of an emulsifying agent, as soap or a softening agent such as Calgon, improves the whiteness of the product.

Bragg *(6)* has used nickelous compounds in an alkaline treatment before the final hypochlorite bleaching stage for inked and colored ledger paper.

In a patent issued to Coster *(9)* hypochlorite is added to the chlorination stage shortly after the introduction of chlorine at such a rate that hypochlorous acid will form instantly. The treated pulp becomes orange in color and can be fully bleached in one or more stages.

A process claimed to be adaptable to the bleaching of wood pulp and employed for textiles is the Kauffman *(25)* method of impregnating the cellulosic material with an alkaline solution of hydrogen peroxide and allowing it to bleach in the damp condition.

According to a patent issued to Reichert and others *(46)*, groundwood can be bleached by using an alkaline peroxide at a pH 10-11 and in a temperature range of 26-49 deg. C. To adjust the alkalinity, sodium silicate is added. Craig *(10)* also uses an alkaline solution of hydrogen peroxide to bleach groundwood pulp, but this is followed by an acid sulphite treatment.

Control and Testing Methods

It seems quite generally agreed that the progress of the pulp bleaching process can be followed quite readily by the cuprammonium viscosity test. Klauditz *(27)* refers to a rapid viscosity test for the purpose of disclosing variations from normal practice in the bleaching process. He notes that the strength of the original unbleached pulp is retained after bleaching if the viscosity of the bleached pulp does not fall below 50 to 35. If the viscosity is lowered to the range 30 to 20 (average polymerization value 900-700) a slight but noticeable strength loss may be observed. Klauditz states that Staudinger and Reinecke noticed a marked strength loss when the average polymerization value falls below 700 to 800.

Milov *(37)* used a cuprammonium solution to swell fibers, after the manner of Lewis and Carpenter, to observe under the microscope the effect on the fiber of overcooking and overbleaching.

Doering *(11)* described a simplified method for determining the cuprammonium viscosity. The pulp is dissolved in wide-mouthed bottles, and pieces of copper are added to remove any oxygen present and assist mechanically in dispersing the pulp. The solution containing the dissolved pulp is then transferred to the capillary tube for the viscosity measurement.

Dimethyl dibenzyl ammonium hydroxide (Triton F) is suggested in place of cuprammonium solution as a solvent for cellulose to determine the degree of degradation *(67)*. Bleached cotton cellulose was found to dissolve readily in this reagent at a normality of 1.96. The fluidities in Triton F of several cotton celluloses were nearly a tenth of the cuprammonium values. The method is more simple and rapid than the customary cuprammonium methods.

The viscosity test is used by one manufacturer in controlling the refining processes in the preparation of practically all types of papermaking pulps *(50)*.

Extensive application of the viscosity test to follow the progress of the bleaching process has been reported by Rich *(47)*. He used the test as a means of establishing the amount of caustic to be added in the hypochlorite stage. A description of his rapid viscosity method is given, and it is claimed the entire test can be made in 15 minutes.

In a symposium on spectrophotometry at the 25th Annual Meeting of TAPPI in 1940, Hatch *(18)* pointed out that the problem of evaluating the color of pulps is one which involves the exact physical measurement of color rather than the expression of color value in psychological terms. While the best instrument is an automatic recording spectrophotometer, on account of its high cost many mills use an abridged spectrophotometer or brightness tester for research purposes and manufacturing control.

According to a survey made by TAPPI *(59)* of color measuring instruments employed in the pulp industry, a number of mills are using spectrophotometers (abridged or unabridged) for measuring and controlling pulp color. Several mills use their brightness testers for this purpose.

In order to determine more exactly the amount of calcium hypochlorite required to produce a pulp of specified brightness, Koon *(30)* has developed a procedure by which five portions of a given pulp are treated with varying amounts of calcium hypochlorite solution, at a temperature of 55 $\pm$ 1 deg. C., until the bleach is practically exhausted. Brightness readings are made on the bleached pulps using the reflection meter. The bleach requirement is the interpolated percentage of available chlorine required to give a brightness of 75 (or any other desired brightness for control purposes). To obtain a definite degree of brightness the percentage bleach requirement by this method should not vary by more than 0.33 unit for a requirement of 5% available chlorine, and not more than 0.57 unit for a 10% available chlorine requirement. The correction to be applied for a given mill installation can be calculated from comparative tests against actual mill practice.

Hechtman and Graff *(19)* point out that, while the terms "degree of cooking" and "bleachability" are often used synonymously, the former can be considered as the extent to which the cementing material (lignin) is removed from the fibers in the pulping process, thus permitting their isolation from wood. Bleachability, however, implies the amount of bleach required and the rate of bleaching of a pulp to a predetermined brightness or whiteness. Although lignin is chiefly responsible for the consumption of bleach by pulps, the pitch, resins, and other oxidizable materials also play a part in this reaction. These authors found that the permanganate number gives a somewhat better indication of bleach requirement than the cooking stain value or Roe chlorine number which seem to measure the same properties of a pulp. A definite relationship exists between the cooking stain and the permanganate number, but it is different for different types of pulps—i.e., sulphite, soda, or sulphate.

Kobe and Sundling *(28)* describe a flexible laboratory pulp bleacher originally designed to hold 30 pounds of pulp at 3% consistency. The vertical type equipment contains a draft tube made in three sections to permit the bleacher to operate at three capacities. An agitator is provided to operate at 4 speeds. All metal parts are rubber covered, and the inside of the container is lined with white bleacher tile set with Pennchlor asplit cement. Although designed for low density bleaching, the equipment can be modified to permit its use as a high density bleacher. It is claimed the bleacher has given excellent service in operation and results are comparable with plant practice. Metal corrosion and catalysis of bleaching reactions are avoided.

Two methods are suggested by Adrian and Graff *(1)* for the evaluation of dirt in pulp: (a) a laboratory control method where the total number of specks per gram of pulp and accurate micrometric measurements and qualitative analyses are made, and (b) a mill method for checking dirt count during manufacturing operations. Both methods employ speck counting boxes with transmitted illumination, descriptions of which are given in the article.

Chemical analyses of bleached and unbleached pulps prepared by various processes have been reported by Aronovsky and Dryden *(4)*. The data obtained give no definite correlation between the analytical constants, such as ether extractives, lignin, pentosans, alpha-cellulose, alkali solubility, permanganate number, copper number, and cuprammonium viscosity. No one test can be depended upon to serve as an accurate measure of any other tests. The effect of bleaching on the analytical values depends to some extent on the type of pulp.

The Bleach Plant

In a TAPPI survey covering the experiences of seven sulphate mills, Lee *(32)* has prepared a valuable summary on materials used for bleaching equipment. Recommendation is made for a chlorination vessel that it be made of tile lined concrete, rubber covered steel, wood, or steel protected by chlorinated rubber base paint with rubber above the water line. Impellers for satisfactory service in chlorinators can be made of rubber covered steel, straight 18-8 stainless steel, molybdenum steel, or Durimet. The most durable diffusers for feeding chlorine into the chlorinator are constructed of rubber covered steel and Hastelloy C. Where chlorine water is fed to the chlorinator, rubber covered steel has proved most resistant. For lead-in pipe to the chlorinator various materials are employed: Pyrex glass, glass-lined steel, rubber-covered steel, and others. Plain iron pipe is satisfactory for dry chlorine gas. The most durable materials for dump valves of chlorinators, where acid stocks are used, are rubber covered steel, stainless steel, and Durimet. For neutral stocks, KA_2SMo acid resistant bronze, and Durimet are recommended. Steel and wood-lined steel have proven satisfactory for stock pipes (neutral reaction).

In the alkaline treatment of pulps the materials of construction best suited for the extractor are reinforced concrete with tile lining, cast iron, Stebbins alkali tile, and stainless steel.

In the hypochlorite bleaching stage materials best suited for bleachers are tile lined concrete, and concrete filled tile. The recommended materials for impellers for high density stock are bronze, cast iron, and nickel iron (KA_2SMo is recommended in this instance). For low density stock, the impeller can be made of Promal, Z metal, or cast iron. Some mills report the same material for low and high density bleachers.

For washing acid stocks, wires of Monel metal and KA_2SMo are satisfactory. In the case of neutral or alkaline stocks a Monel, bronze, stainless steel, or KA_2SMo wire has given good results.

To combat corrosion around the bleach plant the best protective finishes for equipment and buildings are Heresite, S.D.O., asphalt paint, lead covering, and chlorinated rubber-base paint. The last mentioned finish has been satisfactory in many mills.

In a discussion concerning the circulation and storage of kraft pulp, Petroe *(44)* comes to the conclusion that, although about 1920 there was a gradual change from the low-density type bleacher unit to high density systems, recent developments in equipment for the handling of low density pulp indicate the desirability of considering low density units again for pulp bleaching. The various methods of circulating pulp are compared in their operating effects to pumps. The author considers the use of either centrifugal, axial, or mixed flow pumps in place of some of the common methods of stock propulsion.

O'Donoghue *(40)* has recently covered the more general considerations in designing a bleach plant in an article in which he discusses batch vs. continuous bleaching, together with the handling and preparing of bleaching chemicals, the materials of construction, and auxiliary equipment. Chlorination temperature should be below 26 deg. C. for best results, although a too low temperature slows up the reaction noticeably. A pH of about 2 is desirable for chlorination. For caustic extraction 0.5—1.0% sodium hydroxide is recommended for easy bleaching sulphite. In the case of hard bleaching pulps the amount may vary from 1.5 to 3%. The extraction temperature is 43-51 deg. C., and the time is about 1 hour. The importance of washing is stressed, the problem being to remove as nearly completely as possible the soluble impurities resulting from the various bleaching reactions.

Equipment readily adaptable for continuous bleaching has been patented by Tomlinson *(63)*. The pulp is mixed with the bleaching agent upon entering a downflow tower, then passes to an upflow tower at the top of which the treated pulp overflows to a storage chest or to another bleaching unit. The system features a unique means of circulating the stock using a screw impeller set in the tower casing to move the stock at the base of the tower.

A patent has been issued to Richter *(48)*, covering the design of the Kamyr continuous bleaching system which was described in the previous review by Jackson and Parsons *(22)*. The general form of the bleacher is a U-shaped tower with a storage chest between the arms of the U. The chemicals for any stage, chlorination, alkaline, or hypochlorite treatment, are mixed with the pulp entering one arm of the tower. The pulp travels by normal or forced circulation to the other arm of the tower where wash water is added, and the stock passes through a screen into the storage chest. An additional wash may be applied, or the pulp may be pumped directly to the top of the tower for the next stage. Additional information *(43)* includes details of operation and pieces of equipment, such as pumps and conveyors.

Descriptions have been published of the new Fernandina pulp mill *(2)* and also of the modernization of the old bleach plant at Soundview *(3)*.

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New England TAPPI Meets at Nashua

The New England Section of the Technical Association of the Pulp and Paper Industry met at the Nashua Country Club, Nashua, N. H. on Friday, May 23rd. Norman I. Bearse of the Champion-International Company presided as chairman.

The afternoon was devoted to a golf tournament and a visit to the machine shops of the Improved Paper Machinery Company in Nashua. Some of the very latest rubber lined equipment made by this company was on display.

Following the dinner V. E. Nunez, vice-president of the Nashua Gummed and Coated Paper Company gave an interesting address on "World Conditions and How the Paper Industry is Likely to be Affected." In this talk Mr. Nunez stressed the responsibility of the technically trained men of the industry for meeting the rapidly changing conditions being brought about by impending shortages of materials.

Other speakers on the same subject were Werner Kaufmann, vice-president of Kupfer Bros. Company, Northbridge, Mass., and R. G. Macdonald, secretary-treasurer of the Technical Association. Mr. Macdonald indicated that the fall meeting of the Association to be held at Ann Arbor, Michigan on September 16-19, 1941 is being organized along lines of interest to every executive in the industry in meeting the existing war trends and problems. It will be a serious meeting that should be attended by mill managers, engineers, superintendents and chemists representing every mill in the industry.

Among those present were the following: L. C. Adams, L. A. Barker, N. I. Bearse, John Bellocot, P. S. Bolton, Arthur M. Brooks, Mr. and Mrs. George Carroll, Chet Child, L. W. Crouse, Mr. and Mrs. C. W. Damon, Mr. and Mrs. R. H. Doughty, Carroll J. Enemark, W. L. Foote, Al Fuller, Russell W. Hamilton, W. F. Hoffman, Chas. I. Horton, O. F. Hutchinson, Werner Kaufmann, W. H. Kenety, Helen U. Kiely, A. E. Kilty, Chas. P. Kirchen, James F. Leahy, R. G. Macdonald, Ben Mayo, R. D. McCarron, F. F. Newkirk, V. E. Nunez, G. F. Parks, R. J. Proctor, Harold R. Rafton, Joseph E. Ryan, Fred W. Schneider, Robert J. Seidl, H. J. Skinner, Thomas L. Stirling, Roy Tewksbury, Joseph J. Thomas, Herbert L. Thompson, Russell Shaw, Donald M. Smith, George R. Wallace III, A. K. Warner, John Willy and Jack Wright.

To Make Sulphate of Alumina

The General Chemical Company, 40 Rector street, New York, N. Y., has awarded general contract to Drake, Wyman & Voss, Inc., 310 S.W. Sixth avenue, Portland, Ore., for erection of proposed new plant at Vancouver, Wash., where tract of about 12 acres of land was acquired recently on Lower River road, near city limits. Initial plant will be used for the manufacture of sulphate of alumina in liquid form, primarily for service for paper mills in that district. Two one-story buildings will be erected, about 51 x 150 feet, and 20 x 35 feet, respectively, reported to cost over $75,000, with equipment.

Hydry Printing Inks*

By D. Robert Erickson[1] and Fred D. Elliott[2]

Abstract

Prior to the development of Hydry, there were four general types of printing inks: (1) news ink type (setting by penetration); (2) oxidizing and/or polymerizing type; (3) solvent type (heat drying, aniline, gravure); and (4) cold set type (drying by chilling of heated ink).

Hydry inks are based on an entirely new principle. They neither oxidize nor polymerize; no solvent is driven off. Offset is prevented by exposing the freshly printed sheet to a moist atmosphere higher in relative humidity than could be obtained in the press room. This is most easily accomplished by impinging steam on the freshly printed sheet. Because the inks will stand high pressroom humidities they stay open on the press and their working properties equal those of the conventional oil-type inks. The moisture of the steam reacts with the top layer of the varnish forming a thin, hard crust which completely overlays the printed film so that offset is eliminated on subsequent rolling or stacking.

These inks give clean and brilliant color and the dried films are not soluble in water or in hot wax.

There were 4 types of printing inks in general use before the development of the Hydry inks. These types are (1) penetrating (news and mimeograph inks); (2) oxidizing and/or polymerizing (letterpress and lithographic inks); (3) solvent (aniline, heat dry and gravure); and (4) cold set (setting of a hot melt ink by chilling). Each of the above types have certain definite advantages and disadvantages which are well known to the art.

Penetrating Type

The successful use of the penetrating types depends entirely on the absorbency of the papers upon which they are printed. The news inks vary in constitution from simple mixtures of mineral oil and pigment to those containing an inexpensive resin in a mineral oil solution plus pigment. The mimeograph inks use nondrying oils including sulphonated oils for a vehicle. These inks are not adapted for printing on hard sheets of paper, and the printing produced on the absorbent sheets is generally soft and not resistant to smudge.

Oxidizing and Polymerizing Types

The oxidizing and/or polymerizing types, exemplified by those inks used on letterpress equipment, harden because the vehicle is primarily a drying oil (tung, linseed, etc.) or a drying oil modified resin containing unsaturated double bonds. The double bonds absorb oxygen from the air, this absorption normally being hastened by drying catalysts which are usually compounds of such metals as lead, cobalt, and manganese. This absorption of oxygen changes the oil from a viscous, printable liquid to a hard solid film. Polymerization, which is sometimes thought to be a contributing factor in the formation of this type of film, is the action of the joining together of small molecules to form larger molecules which tend to assume a solid body. The speed of polymerization depends upon temperature. Polymerization and/or oxidation is a relatively slow process and the printed inks do not dry fast enough to be immediately rewound or stacked after printing without danger of offset. The oxidation of the oil creates peroxides which cause odors that are especially objectionable for food-wrapper inks. In addition this type of ink usually forms a hard insoluble skin when left standing on an idle press or in an uncovered can.

Inks which depend entirely upon heat polymerization to form a hard film are the subject of much research and many recent patents. Examples of this type of ink utilize a vehicle made from urea formaldehyde or melamine formaldehyde condensation products which is still in a viscous stage and depends on the action of heat after printing to further polymerize it to a hard film. Because the amount of heat required for this final polymerization is small, the inks often harden on the press at normal press operating temperatures. This characteristic prohibits their commercial use at the present time.

Solvent Types

There are two major classes of solvent type inks; the heat drying inks using as a solvent for the binding resin, a mineral oil or other solvent which essentially is nonvolatile at room temperatures but volatile at elevated temperatures. The other class includes the aniline and gravure inks which make use of a variety of volatile solvents with binders of various types. The heat required for the volatilization of the solvent in heat drying often permanently dehydrates the sheet which causes register trouble and other difficulties in the subsequent fabrication processes. The equipment required to dry these inks is costly both to install and to operate and these inks tend to dry on the plates and rollers if the press is down a relatively short time.

The volatile nature of aniline and gravure inks limit their use to special equipment. The high cost of gravure cylinders and the limitations of rubber plates used on aniline presses may give rise to further troubles. Another factor that must be taken into consideration in using either heat drying, aniline, or gravure processes, is the difficulty in venting solvent fumes. These fumes are toxic and usually highly inflammable and their control presents operating difficulties. The odors of the solvents used in this type of ink tend to permeate some sheets and are often later absorbed by the product packaged in containers printed with inks of this type.

Cold Set Type

The cold set type of inks depends upon a hot melt process which requires that the fountain, steel ink rolls, and plate cylinders, which come in contact with the ink, be heated above the flow point of the solid ink. When the molten ink comes in contact with

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[2] Member TAPPI, Chemist, Michigan Research Laboratories, Inc., Kalamazoo, Mich.

the relatively cold paper, it solidifies to form a film. These inks are not particularly hard and the necessity of remodeling presses to provide for hot printing, precludes their use in a number of applications.

Hydry Inks

Hydry inks are based on a different principle. They do not oxidize or require the removal of any solvents. These inks consist of a pigment or pigments and a vehicle (or varnish) composed of a synthetic resin and an odorless organic solvent having a high boiling point and a low vapor pressure. The resin is soluble in the solvent and in a mixture of the solvent and a limited quantity of water, but insoluble in a mixture of the solvent and an unlimited quantity of water. When a film of the varnish formed from this resin and solvent is subjected to an unlimited quantity of water, a thin hard film is formed overlaying the plastic adhesive underlaying portion. Letterpress inks can be formulated from a vehicle of this type together with suitable pigment, fillers, waxes, and compounds. Wide variations in viscosity, body, and working properties can be obtained in these inks to make them suitable for many different papers, presses and processing operations that are required of normal letterpress inks.

The primary motive for the development of these inks was to prevent offset immediately after printing and to eliminate some of the disadvantages of other methods of setting ink films. Offset is prevented by exposing the freshly printed sheet to a moist atmosphere higher in relative humidity than could be obtained in the pressroom. This is most easily accomplished by impinging steam on the freshly printed sheet.

In commercial practice the ink is distributed on the press in the ordinary manner, is printed on the desired stock, and immediately thereafter is subjected to steam. The steam increases the water content of the surface of the printed film to form, from the binder of the exposed portion of the printed film, a continuous thin hard film completely overlaying the printed portion. This thin hard crust prevents the ink from off-setting on subsequent rolling or stacking.

Controllable Water Tolerance

The inks possess a controllable water tolerance that makes it possible to use them on the press even though humidity conditions in the pressroom are extreme.

This control of water tolerance, coupled with the fact that the solvent used has such a low vapor pressure accounts for the fact that these inks will remain open on the press for long periods of time. This is a major improvement over the usual type of fast-setting inks.

These inks will dry to a hard tack-free film on such papers as coated book, sulphite bond, and kraft in less than an hour without the application of extra moisture. In this case, however, it is necessary to take care of the offset by the use of spray or by back-waxing as used in bread-wrapping printing plants. This is of interest to the bread-wrapper manufacturer, because he is able to make use of standard presses equipped with rubber rolls and is able to print, wax, rewind, and ship his product in a few hours.

Other attributes that are inherent in this type of ink are lack of odor, extreme cleanliness, and brilliance of color, excellent nonrub characteristics, and superior sealing properties on all-over ink designs in waxed bread wrappers.

Unique Among the Inks

It is unique among the inks, because when properly formulated and printed it gives a finished print that is odorless. This lack of odor is due to two factors: (1) neither the resin nor solvent are subject to oxidation, and (2) the solvent is odorless and does not present the problem of the solvents used with the heat dry, aniline, and gravure processes. A few of the foods most easily affected by residual ink odors in printed matter are milk, lard, butter, bacon, and bread. The cigarette manufacturers are interested in this lack of odor in wrappers and packages as they desire to have their customer smell tobacco, not printing ink, when opening a carton of cigarettes.

The ink does not skin because no drying catalysts are present, and the ink is not subject to oxidation or solvent loss through volatility.

Hydry inks often give much better mileage than conventional oil inks. This of course is dependent on the printer and his ability to take advantage of the better coverage and brilliance of these inks in thinner films.

The type of surface tension of the varnish used in these inks differs from that of conventional oil ink varnishes. Under microscopic examination of halftone prints it has been noted that the Hydry inks do not spread, bleed, or form a halo around the individual dots. They do not eliminate entirely the "doughnut" effect on each halftone dot but they do tend toward more complete coverage of the dot in every instance. This is probably due to the different type of surface tension that the vehicles possess over oil vehicles, and to the better affinity that Hydry inks possess for cellulose fiber. All papers have a definite water content and theoretically we can assume that this normal moisture content repels rather than attracts typical oil ink vehicles. The water tolerance of formulations is one of the determining factors for this better affinity for the cellulose fiber.

The lower layer of a printed film of Hydry ink is in a plastic state and has good adhesive properties. The upper layer can be made hard and slippery. These factors tend to give the ink superior nonrub and nonscratch characteristics. When formulated with nonbleeding pigments, the freshly printed films of inks are not soluble in water or hot wax.

Beneficial Effect on Paper

The process of preventing offset has a beneficial effect on the paper, because it raises the moisture content to the correct percentage for optimum strength characteristics. Yet the moisture application can be controlled within narrow limits.

The installation of a steam applicator is not expensive and the only other requirement for the use of this ink is that the press be equipped with rubber rollers. Hydry inks and varnishes do not have any deleterious effect on rubber rollers or rubber plates, and actual practice has proven that the life of rubber rollers is greater than the life of the ordinary composition rollers.

These inks have been tested and used commercially in selected types of printing plants throughout the country for over two years to find the particular applications for which they are best suited.

Imports of Paper and Paper Making Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard; Bleached Sulphite More Acute—Some Grades of Old Waste Lower.

Effective September 30, 1939, under Treasury Decision 49,970, all publications, exchanges and trade associations, were denied access to import manifests at the New York Customs House. The Paper Trade Journal and other interested parties have vigorously protested this ruling, and as soon as the order of the Treasury Department is modified or rescinded, full publication of all manifests will be resumed in these columns. In the interim, the Paper Trade Journal is making every possible effort to gather all available information from manifests, at various outside sources.

NEW YORK IMPORTS

WEEK ENDING MAY 24, 1941

SUMMARY

Newsprint	15,642 rolls
Printing paper	5 cs.
Photo paper	27 cs.
Decalcomania paper	109 cs.
Tissue paper	49 cs.
Filter paper	68 cs.
Tracing cloth	21 cs.
Stencil paper	2 cs.
Writing paper	1 cs.

NEWSPRINT

International Paper Co., ——, Gatineau, 281 rolls.
H. G. Craig Co., Inc., ——, Donnacona, 365 rolls.
International Paper Co., ——Gatineau, 289 rolls.
——, ——, Liverpool, N. S., 6,294 rolls.
H. G. Craig Co., Inc., ——, Donnacona, 339 rolls.
——, ——, Comeau Bay, 7,738 rolls.
H. G. Craig Co., ——, Donnacona, 336 rolls.

PRINTING PAPER

Oxford University Press, ——, Liverpool, 5 cs.

PHOTO PAPER

——, ——, Liverpool, 27 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., ——, Liverpool, 97 cs., (duplex).
——, ——, Liverpool, 12 cs.

TISSUE PAPER

G. F. Malcolm, ——, Liverpool, 48 cs.
——, ——, London, 1 cs.

FILTER PAPER

——, ——, Liverpool, 34 cs.
H. Reeve Angel & Co., Inc., ——, London, 34 cs.

TRACING CLOTH

——, ——, Liverpool, 21 cs.

STENCIL PAPER

Frankel Carbon & Ribbon Co., ——, London, 2 cs.

WRITING PAPER

——, ——, London, 1 cs.

RAGS, BAGGINGS, ETC.

Chase National Bank, ——, Murmansk, 111 bls. new linen rags, 103 bls. flax waste, 1,230 bls. hemp cuttings.
——, ——, Murmansk, 191 bls. rags.
American Express Co., ——, Murmansk, 239 bls. rags.
——, ——, Buenos Aires, 580 bls. cotton linters.
——, ——, Liverpool, 136 bls. rags.
Williamson Products Co., ——, Pernambuco, 340 bls. cotton linters.
Schimmel Trading Corp., ——, Pernambuco, 180 bls. cotton picker waste.
Padawer & Co., ——, Cabedello, 150 bls. cotton waste.
Cowa & Co., ——, Cabedello, 106 bls. cotton waste.
——, ——, London, 28 bls. paper stock, 39 bls. rags.
National City Bank, ——, Buenos Aires, 5 bls. rags.
West Texas Cottonoil Co., ——, Buenos Aires, 233 bls. cotton linters.
Hercules Powder Co., ——, Buenos Aires, 359 bls. cotton linters.

HIDE CUTTINGS, ETC.

——, ——, Liverpool, 480 bags hide cuttings.
Guaranty Trust Co., ——, Buenos Aires, 40 bls. hide fleshings.
Biological Raw Products, Inc., ——, Buenos Aires, 295 bags skin glue.
Trans-Atlantic Animal By-Products Corp., ——, Rio Grande, 500 bags glue, 25,000 kilos.

CASEIN

American Cyanamid & Chemical Corp., ——, Buenos Aires, 3,253 bags, 195,180 kilos.
H. S. Cramer & Co., Inc., ——, Buenos Aires, 834 bags.
A. Hurst & Co., Inc., ——, Buenos Aires, 1,251 bags.
American British Chemical Supplies, ——, Buenos Aires, 834 bags.
Packing Products Co., ——, Buenos Aires, 417 bags.
American Cyanamid & Chemical Corp., ——, Buenos Aires, 834 bags.

LOS ANGELES IMPORTS

WEEK ENDING MAY 24, 1941

——, ——, Osaka, 30 cs. transparent paper.

Buys Western Adhesives Plant

Murray Stempel, Vice President and General Manager of Paisley Products, Inc., Chicago, Ill., announced last week that his firm has purchased the equipment, formulas, and manufacturing processes of Western Adhesives Company, also of Chicago.

Manufacturing will be transferred to the Paisley plant, which is now undergoing extensive alterations and expansion of storage, laboratory and manufacturing facilities.

Mr. Herman Liberman, formerly of Western Adhesives, and well-known to the printing, paper box, and allied trades, will continue to contact this field for Paisley.

Paisley Products, Inc. is a subsidiary of Morningstar, Nicol, Inc., New York, who also operate a Paisley plant in New York City, and a dextrine plant at Hawthorne, N. J. Another subsidiary, Aroostock Potato Products, Inc., is located at Houlton, Maine.

Goes With Morris Machine Works

Morris Machine Works, Baldwinsville, N. Y., manufacturers of centrifugal pumps, hydraulic dredges and steam engines, announces the appointment of H. J. Lynch as their new representative in the Detroit district. Mr. Lynch is located at 403 Kales building, Detroit, and his telephone number is Randolf 6021.

New York Paper and Pulp Market Review

Consumption For Many Grades of Paper Rising With New Orders Increasing Backlogs In Most Lines — Pulp Market Strong With Production At High Level — Old Domestic Gunny Higher.

Office of the PAPER TRADE JOURNAL,
Wednesday, May 28, 1941.

Sales volume in the wholesale market continues at a high level with the trend upward, according to reports received from many sources this week. New orders are so heavy that leading mills report backlogs are steadily increasing under the record-breaking demand for most lines of paper.

The index of general business activity for the week ended May 17 advanced to a new high of 127.8%, from 126.2% for the preceding week, compared with 103.7% for the corresponding week last year. Paper board production increased 6.2%.

Paper production for the week ended May 17 was estimated at 98.8%, compared with 91.7% for 1940, with 79.3% for 1939, with 69.5% for 1938, and with 91.2% for the corresponding week for 1937.

Paper board production for the week ended May 17 was 84.0%, compared with 76.0% for 1940, with 65.0% for 1939, with 58.0% for 1938, and with 86.0% for 1937.

Newsprint production of domestic mills increased in the first four months of the current year 1.8% over the like period last year, or 6,219 tons; Canadian production increased 5.9% or 59,589 tons. Total North American production for the same period was 72,986 tons, or 6.6%. Prices hold unchanged.

With demand at so high a level and with the trend upward, the paper market today is approaching the great activity of 1920, when backlog orders amounted to 12 weeks production in some divisions of the industry. Prices today, however, are about one-half under the peak of 1920.

Some small price increases have been reported during the last week but they are unimportant and do not reflect the market as a whole. The average of representative market quotations remains unchanged and no change is expected in the trade until the third quarter.

Wrapping, writing and printing papers, according to the latest figures of the Department of Commerce, were very active with the production index at 126 for April, compared with 100 for 1935-39. Increases in some paper items ranged from 2 to 6%. Output of all paper, excluding newsprint and paper board, in April increased 3.0% over March. Wholesale sales volume increased 9.0% in April.

Chemical Pulp

Demand for all prime grade of chemical pulp is reported heavy. Wood pulp production in April, according to the Department of Commerce, made a new high record. Mill shipments to converters increased in bleached sulphite and in unbleached sulphate. The index of sulphite pulp production for March was 156; sulphate 203; groundwood 127, based on 100 for 1935-39.

Imports of pulp for March were up 22.0% and exports were 44.0% higher than in February.

Contract prices on all grades of pulp continue unchanged.

Rags

New rags are in a strong market position with a good demand for a few grades that about balances supplies. Prices are therefore firm, with no important changes reported this week.

Old Rope and Bagging

The old rope market is very firm. Mill buying is steady of old Manila rope. Prices are unchanged at this date.

Active demand and limited supplies of old bagging continue to create a strong market situation, with pressure for higher prices. Current quotations on domestic scrap bagging have advanced this week and currently quoted at from 4.15 to 4.25.

Old Waste Paper

Mixed papers, folded news and old corrugated reflect a strong position in the market this week. Prices are unchanged, with the expectation of some advances in the lower grades of paper stock in some quarters of the trade.

Twine

Imported fibers continue in a strong position, because of shipping difficulties and uncertainties. The general market situation is strong, with prices firm and the expectation of higher prices on some grades in the near future in some quarters of the trade. Average representative market quotations remain unchanged at this date.

Government Paper Bids

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., May 28, 1941—Government Printing Office has received the following bids for 199,000 pounds (1,000,000 sheets) of 35 x 45 supercalendered book paper: Frank Parsons Paper Company, 5.84 cents; R. P. Andrews Paper Company, 5.65 cents; Paper Corporation of U. S., 6.21 cents; and Stanford Paper Company, 6.34 cents.

For 80,700 pounds (300,000 sheets) same 38 x 48, Lot. 28: Frank Parsons Paper Company, 5.84 cents; R. P. Andrews Paper Company, 5.65 cents; Mudge Paper Company, 5.84 cents; and Stanford Paper Company, 6.34 cents.

For 259,500 pounds (1,500,000 sheets) of same Lot. 26: Frank Parsons Paper Company, 5.948 cents; R. P. Andrews Paper Company, 5.93 cents; and Stanford Paper Company, 6.85 cents.

For 70,000 pounds of 22½ x 28½ wood bristol board: Whitaker Paper Company, 5.95 cents; R. P. Andrews Paper Company, 5.95 cents; Barton, Duer & Koch Paper Company, 5.25 cents; Old Dominion Paper Company, 4.982 cents.

For 15,000 sheets of 24 x 36 brown cloth lined paper: Mudge Paper Company, $124.14 per M sheets; Middlesex Products Corp., $125.00; Barton, Duer & Koch Paper Company, $123.34; Whitaker Paper Company, $124.02; and Stanford Paper Company, $130.00.

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, May 28, 1941.

BLANC FIXE—Quotations on blanc fixe are firm and continue unchanged at prevailing market levels. Demand reported steady for the week. The pulp is currently quoted at $35 per ton in barrels, at works; the powder is offered at $50 per ton, f.o.b., works.

BLEACHING POWDER—Prices on bleaching powder are firm with shipments reported in moderate volume for the week. Bleaching powder is currently quoted at $2 per 100 pounds, in drums, at works.

CASEIN—Quotations on casein are reported firm. Demand steady for the week. Standard domestic casein, 20-30 mesh, is currently quoted at 19 cents per pound; 80-100 mesh, at 19½ cents per pound; all prices in bags, car lots. Standard Argentina casein is currently offered at 16 cents per pound. No quotations on French casein.

CAUSTIC SODA—Prices on caustic soda are unchanged. Demand reported good for the week. Solid caustic soda is currently quoted at $2.30 per 100 pounds, flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm and continue unchanged this week. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay at from $12 to $22 per ton, at mines. Imported clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—The demand for chlorine is reported active. Prices are firm and the market strong for the current week. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—Quotations on most grades of rosin are lower for the week. "G" gum rosin is currently quoted at $1.85 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $1.85 per 100 pounds, in barrels, New York. Seventy per cent gum rosin size is quoted at $2.54 per 100 pounds f.o.b., works.

SALT CAKE—Prices on salt cake are firm. Demand good, market strong, with current quotations nominal. Domestic salt cake is currently quoted at $17 per ton in bulk; chrome salt cake at $16 per ton. All prices in car lots, f.o.b., shipping point. The quotation of $16.50 per ton on imported salt cake continues nominal.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market quotations. Shipments reported steady. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch are firm and continue unchanged for the current week. Pearl is currently quoted at $3 per 100 pounds; powdered starch at $3.10 per 100 pounds; all prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Shipments reported in good volume for the week. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at $1.60 per 100 pounds, in bags, car lots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and continue to conform to prevailing market quotations. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $19 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $15 to $21 per ton, at mills. No quotations on imported talc.

MARKET QUOTATIONS

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Delivered Zone A			
Northern, Extra Quality	$5.25	@	$6.00
Superstandard	4.87½	"	5.25
Northern Standard Wrapping	4.50	"	5.00
Standard Wrapping	4.50	"	—
Tissues—Per Ream—Carlots			
White No. 1	.97½	"	—
White No. 1 M. G.	.95	"	—
White No. 1½	.80	"	—
White No. 2	.75	"	—
Anti-Tarnish M. G.	.80	"	—
Colored	.85	"	—
Kraft	.87½	"	—
Manila	.77½	"	—
Unbl. Toilet, 1 M.	3.75	"	—
Bleached Toilet	5.26	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.10	"	—
Bleached, Jr.	3.60	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	8.75	@	10.75
No. 1 Manila Wrapping, 35 lb.	5.50	"	5.75
No. 2 Manila Wrapping, 35 lb.	5.25	"	5.50
Boards, per ton—			
News	45.00	@	—
Chip	45.00	"	—
Sgl. Mla. Ll. Chip	60.00	"	—
White Pat. Coated	75.00	"	—
Kraft Liners	55.00	"	—
Binders Boards	80.00	"	—

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers
100% Rag Ext. No. 1	$39.10 @ $46.00		$40.25 @ $47.25
100% Rag	31.05 " 36.50		32.20 " 37.75
85% Rag	.... "		29.90 " 35.00
75% Rag	23.60 " 27.75		24.75 " 29.00
65% Rag	.... "		21.65 " 26.25
50% Rag	17.55 " 21.50		18.70 " 22.75
25% Rag	14.65 " 17.75		15.80 " 19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds		Ledgers
No. 1	$9.35 @ $11.50		$11.55 @ $12.75
No. 2	8.50 " 10.25		9.65 " 11.75
No. 3	8.05 " 9.25		9.20 " 11.25
No. 4	7.70 " 9.50		8.90 " 10.75

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper.

Delivered in Zone 1:

No. 1 Glossy Coated	$11.90	@	$13.50
No. 2 Glossy Coated	10.35	"	11.75
No. 3 Glossy Coated	9.55	"	11.00
No. 4 Glossy Coated	9.15	"	10.50
No. 1 Antique (watermarked)	9.05	"	10.50
No. 2 Offset	8.40	"	9.75
A Grade E. F.	8.20	"	9.50
A Grade S. & S. C.	8.45	"	9.75
B Grade E. F.	7.65	"	8.75
B Grade S. & S. C.	7.90	"	9.00
C Grade E. F.	7.35	"	8.50
C Grade S. & S. C.	7.60	"	8.75
D Grade E. F.	7.10	"	8.25
D Grade S. & S. C.	7.35	"	8.50

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	No prices		
Dry	No prices		

(Delivered)

No. 1 Domestic and Canadian	40.00	@	42.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	3.72½	@	3.87½
Prime Qualities—			
Easy-Bleaching Sulphite	3.17½	"	3.75
Strong Unbleached Sulphite	3.17½	"	3.75
News Grade, delivered			
Unbleached Sulphite	61.00	"	64.25

(On Dock, Atlantic Ports)

Kraft Bleached	4.12½	"	——
Kraft Light & Strong	3.75	"	4.15
Kraft No. 1	3.60	"	4.00

(F. o. b. Pulp Mill)

Kraft Domestic and Canadian	2.75	"	3.37½

(Delivered)

Soda Bleached	3.30	"	——

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1.	6.00	@	6.25
Silesias No. 1	4.25	"	4.50
New Unbleached	6.00	"	6.25
Blue Overall	4.25	"	4.50
Fancy	2.25	"	2.50
Washables	2.00	"	2.15
Mixed Khaki Cuttings	2.50	"	2.75
O. D. Khaki Cuttings	3.00	"	3.15

Old Rags

White, No. 1—			
Repacked	3.10	"	3.35
Miscellaneous	2.35	"	2.65
White, No. 2—			
Repacked	2.50	"	2.75
Miscellaneous	2.00	"	2.25
Thirds and Blues—			
Repacked	1.25	"	1.35
Miscellaneous	1.10	"	1.25
Roofing Rags—			
No. 1	1.30	"	1.35
No. 2	1.20	"	1.25
No. 3 (bagging)	.95	"	1.00
No. 4	.90	"	.95
No. 5A	.90	"	.95

Foreign Rags

All prices nominal.

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	"	4.75
No. 2 White Cotton.	3.25	"	3.75
No. 3 White Cotton.	2.50	"	3.00
No. 4 White Cotton.	1.90	"	2.20
Extra Light Prints..	2.00	"	2.40
Ord. Light Prints...	1.75	"	2.15
Med. Light Prints...	1.55	"	1.95
Dutch Blue Cottons.	2.25	"	2.50
French Blue Linens.	3.00	"	—
Checks and Blues...	2.00	"	—
Linsey Garments....	1.90	"	2.00
Dark Cottons.....	1.50	"	1.60
Old Shopperies.....	1.30	"	1.45
New Shopperies.....	1.45	"	1.50
French Blues.....	2.25	"	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.15	@	4.25
Wool Tares, light....	2.50	"	2.75
Wool Tares, heavy..	2.50	"	2.75
Bright Bagging.....	3.15	"	3.30
Manila Rope—			
Foreign	5.50	"	5.75
Domestic	5.50	"	5.75
Jute Threads.....	2.75	"	3.00
Sisal Strings	2.10	"	2.35
Mixed Strings.....	1.10	"	1.20

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	3.10	@	3.25
Ordinary Hard White No. 1....	2.60	"	2.75
Soft White No. 1..	2.25	"	2.35
Soft White Extra..	2.70	"	2.85
Flat Stock—			
Stitchless	1.10	"	1.25
Overissue Mag.....	.90	"	1.00
Solid Flat Book....	.90	"	.95
Crumbled No. 1...	.70	"	.75
Ledger White Stock.	1.65	"	1.75
Ledger Stock Colored	1.20	"	1.30
Manila—			
New Env. Cut....	1.70	"	1.80
New Cuttings.....	1.80	"	1.90
Old Kraft Machine Compressed bales..	1.35	"	1.50
News—			
No. 1 White News	1.50	"	1.60
Strictly Overissue..	.96	"	1.00
Strictly Folded....	.60	"	.65
Corrugated	.60	"	.62½
No. 1 Mixed Paper..	.42½	"	.47½

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.19½	@	—
White Hemp	.19¼	"	—
Fine Polished—			
Fine India.....	.22¼	"	—
Unpolished—			
Box	.15¾	"	—
Paper Makers.....	.15½	"	—
Tube Rope.....	.16¾	"	—
Wall Paper.....	.19½	"	—
Wrapping	.19½	"	—
Soft Fiber Rope...	.17½	"	—
Cotton	.24	"	—

(Hard Fiber)

Medium Java.....	.12	"	—
Mex. Sisal.....	.11	"	—
Manila	.25	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1.	.06½	@	.06¾
New White No. 2.	.03½	"	.04
Light Silesias.....	—	"	.04½
Silesias, No. 1....	—	"	.04
Black Silesias, soft	—	"	.03
New Unbleached..	.06¼	"	.06½
Washable Prints..	.02½	"	.03
Washable No. 1..	—	"	.01½
Blue Overall.....	.04	"	.04½
Cottons—According to grades—			
Washable shredding	—	"	.01½
Fancy Percales....	.03	"	.03¼
New Black Soft...	.02½	"	.02¾
New Light Seconds	—	"	.04
New Dark Seconds	—	"	1.50
Khaki Cuttings—			
No. 1 O. D.....	.03	"	.03¼
No. 2 Mixed.....	.02	"	.02¼
Corduroy	.01¼	"	.01½
New Canvas.....	.04½	"	.05
New Black Mixed.	—	"	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.75	"	3.00
Thirds and Blues—			
Miscellaneous	1.35	"	1.50
Repacked	1.55	"	1.65
Black Stockings (Export)	Nominal		
Roofing Stock—			
Foreign No. 1....	Nominal		
Domestic No. 1...	1.30	"	1.35
Domestic No. 2...	1.10	"	1.15
Roofing Bagging..	1.00	"	1.05

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	3.25	@	3.75
Domestic	3.00	"	3.25
Manila Rope.....	—	"	5.50
Sisal Rope.....	2.00	"	2.25
Mixed Rope.....	.75	"	1.00
Scrap—			
No. 1.....	3.00	"	3.25
No. 2.....	—	"	1.50
Wool Tares, heavy..	3.75	"	4.00
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.25	"	3.50

Old Papers

(F. o. b. Phila.)

Shavings—			
Hard White Special	2.50	@	2.70
Hard White.....	2.35	"	2.40
No. 1 Soft White..	1.90	"	2.00
No. 2 White.....	1.70	"	1.85
No. 1 Mixed.....	.90	"	1.00
Solid Ledger Stock..	1.90	"	2.00
Ledger Stock, white.	1.50	"	1.60
Ledger Stock, colored	1.25	"	1.30
No. 1 Books, heavy..	.85	"	.90
Manila Cuttings....	1.75	"	1.80
Print Manila.....	.60	"	.65
Container Manila....	.50	"	.55
Kraft Paper	1.40	"	1.45
No. 1 Mixed Paper..	.45	"	.50
Straw Board Chip...	.45	"	.50
Binders Board Chip..	.35	"	.40
Corrugated Board...	.60	"	.65
Overissue News.....	.85	"	.90
Old Newspapers.....	.60	"	.65

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	3.15	@	3.25
No. 1 Soft White	2.50	"	2.75
No. 2 Mixed.....	.90	"	1.00
Solid Ledger Books..	2.00	"	2.10
Overissue Ledger Stock	1.75	"	2.00
White Ledger Stocks	1.50	"	1.65
Mixed Ledgers	1.25	"	—
No. 1 Heavy Books	1.10	"	1.20
No. 1 Books, Light..	.75	"	.85
Crumpled Stitchless Book Stock	1.15	"	1.20
Manila Env. Cuttings	3.00	"	3.25
Manila Envelope Cuttings, extra quality	2.65	"	2.75
White Blank News..	1.70	"	1.80
No. 1 Kraft.....	1.35	"	1.45
Extra No. 1 Kraft..	1.75	"	—
Mixed Papers.....	—	"	.40
Print Manila	.60	"	.65
Container Manila....	.60	"	.70
Old Newspapers.....	.47½	"	.52½
Paper Wool Strings.	.95	"	1.15
Overissue News.....	.65	"	.70
Box Board Chips....	.35	"	—
Corrugated boxes....	.60	"	.70
Kraft corrugated boxes	1.20	"	1.30
New Kraft Corrugated Cuttings	1.75	"	2.00
Screening Wrappers.	.85	"	.90

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	3.75	@	4.00
Sisal Rope.....	2.60	"	2.75
Mixed Rope	.85	"	1.00
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Soft Jute Rope.....	4.25	"	4.75
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	6.00
Jute Carpet Threads.	3.00	"	3.25
Bleachery Burlap....	5.00	"	5.50
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.25	"	3.75
Scrap Sisal.....	2.75	"	3.00
Scrap Sisal for Shredding	2.75	"	2.90
Wool Tares—			
Foreign	(nominal)		
Domestic	2.85	"	3.00
Aust. Wool Pouches.	3.50	"	3.75
New Burlap Cuttings	4.00	"	4.25
Heavy baling bagging	3.25	"	3.50
Paper Mill Bagging..	2.75	"	3.00
No. 2 Bagging.....	.75	"	.80

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	—	@	.03
Fancy Percales....	.03¾	"	4.00
New White No. 1.	.06	"	.06¼
New Light Flannelettes	.03¾	"	4.00
Canton Flannel, Bleached	.06	"	—
Underwear Cutters, Bleached	.06¼	"	.06½
Silesias No. 1.....	.04	"	.04¼
New Black Silesias..	4.00	"	—
Red Cotton Cuttings	.04	"	.05
Soft Unbleached....	.06	"	.06¼
Blue Cheviots.....	.04¼	"	.04½
Fancy	.01½	"	.01¾
Washable	.01½	"	.01¾
Cottons—According to Grades—			
Blue Overalls.....	.04	"	.04¼
New Black, Soft..	.03	@	.03¼
Khaki Cuttings.....	.02	"	.02¼
O. D. Khaki.....	.02½	"	.03¼
Corduroy	.02	"	—
New Canvas.....	.05½	"	—
B. V. D. Cuttings...	.06	"	.06¼

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	2.75	@	3.00
Miscellaneous	2.00	"	2.25
White No. 2—			
Repacked	1.90	"	2.00
Miscellaneous	2.00	"	2.25
Twos and Blues.....	2.00	"	2.25
Old Blue Overalls...	1.60	"	2.00
Thirds and Blues....	1.25	"	—
Miscellaneous	1.25	"	1.35
Black Stockings.....	3.50	"	4.00
Roofing Stock—			
No. 1.....	1.20	"	1.25
No. 2.....	.95	"	1.00
No. 3.....	.85	"	.95

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons.....	(nominal)
Dutch Blues.....	(nominal)
New Checks and Blues	(nominal)
Old Fustians.....	(nominal)
Old Linsey Garments.	(nominal)
New Silesias.....	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings....	3.15	@	—
No. 1 Hard White	2.50	"	2.65
No. 1 Soft White.	2.00	"	2.20
Ledger and Writings	.85	"	.95
Solid Books.....	.83	"	—
Blanks	1.45	"	—
Krafts	1.40	@	1.50
New Kraft Cuts....	1.60	"	1.75
Overissue News.....	.00	"	—
Old Newspapers—			
No. 1 Folded News	.70	"	.80
No. 1 Mixed Paper	.45	"	—
Roofing Stocks—			
No. 1.....	.95	"	1.00
No. 2.....	.85	"	.90

Ocean Falls Employees Get Bonus

A cost of living bonus of $1.25 per week will be paid to more than 2000 employees of the Powell River Company Ltd. and Pacific Mills, Ltd., at Ocean Falls, B. C., as a result of a week's negotiations between company and union representatives which concluded recently.

A certain number of the employees will also receive substantial wage increases resulting from wage rate adjustments made on an individual basis. The agreement will go into effect May 1.

John Sherman of Tacoma, international vice-president of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, explained that the recent action of the Dominion Government in bringing the pulp and paper industry within the scope of order-in-council O.C. 7440, made it impossible for the union to bargain for an increase in the general wage rate "as we would have done otherwise."

The order-in-council question pegs wages at the 1926-29 level, but, at the same time, provides for bonuses to meet fluctuations in the cost of living.

The new agreement, Sherman said, brings wage rates in the two British Columbia companies "more in line" with Pacific Coast agreements now in force south of the line.

Adjustable V-Belts

An interesting example of pictorial presentment of a product for industrial use is the "Veelos Pictorgraph," a booklet just issued by the Manheim Manufacturing and Belting Company, Manheim, Pa. It gives a clear explanation of the application, merits and advantages of the company's Veelos adjustable V-belting, including installation directions.